AGT

PREPAY PUBLIC COIN TELEPHONE SERVICE

COURSE NO. 05041

Student Reference Book

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AGT LIMITED
CUSTOMER SERVICES

COURSE NUMBER 05041

PREPAY PUBLIC COIN TELEPHONE

STUDENT REFERENCE BOOK

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TECHNICAL TRAINING
AGT LIMITED
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Maintenance of Centurion Prepay Coin Telephones

Contents

1.0 GENERAL

1.01 This practice is intended as an on the job reference for station installation and repair personnel responsible for the maintenance of Centurion prepay coin telephones.

1.02 Personnel responsible for maintaining coin telephones are required:

a. to have completed the coin phone course or equivalent experience.

b. access to tools, test equipment and materials listed in Section 3.

c. access to replacement parts listed in Section 4.

d. to adhere to Operations Practices (OP's) dealing with the handling of keys, overflow coins and expense claims for coins used during testing.

e. access to the following practices on Centurion Prepay sets for reference.

506-3209-100	Functional Description of Centurion QSD400A and QSD2400A Prepay Sets
506-3221-101	Centurion Prepay Telephone Sets Detailed Description
506-3221-200	QSD400A and QSD2400A Identification and Installation
506-3221-290	Installation Manual

2.0 MAINTENANCE PHILOSOPHY

2.10 Responsibility

Station repair personnel are responsible for the maintenance and repair of coin sets. Loop or central office problems, detected on repair visits, are to be reported to the craft responsible by station repair personnel. Station repair personnel are also required to report full coin boxes and coin overflows to the Coin Centre for collection.

2.20 Fault Detection

Customer trouble reports, operator reports or central office coin alarms identify to maintenance personnel that corrective maintenance is required. Standard repair procedures correct most station troubles, however, some station faults can only be identified by a systematic series of tests and inspections. These tests and inspections make up the seven step routine in section 5 of this practice.

The operational tests and inspections serve three functions. First, to verify the overall operation of the set, loop and central office in providing coin service. Second to sectionalize faults within the set to a defective sub-assembly. The third function of the inspections and tests is to ensure all faults are corrected on the first repair visit to avoid repeat reports and repairs.

2.30 Preventative Maintenance

By performing the inspections and operational tests outlined in the seven step routine, preventative maintenance is being done on each installation and repair visit. Therefore scheduled routine inspections in most cases are not required.

A schedule routine inspection of coin stations in a maintenance area may be implemented for the following reasons:

a. Training - provide on the job training for personnal having completed the Coin Phone Course.

b. Reduce trouble report rate - by identifing those sets that are out of service and unreported.

c. Increase revenue - improve service by insuring all sets are in working order, installation is clean and signs are inplace.

d. Improve public relations - stations located in tourist areas, that have seasonal use, must be routined prior to the high usage season.

2.40 Corrective Maintenance

The repair of Centurion coin sets is limited to replacement of defective sub-assemblies and the cleaning or lubricating of mechanical devices. No field adjustments to sub-assemblies are required or are to be attempted.

The trouble analysis section of this practice will refer to procedure charts covering all replaceable components.

3.0 TOOLS, TEST EQUIPMENT AND MATERIALS

This section covers the identification and use of tools, test equipment and materials required, in addition to those normally carried, to properly install and maintain Centurion prepay coin telephone sets.

3.10 Tools

NAME	NUMBER	FIGURE	USE	REMARKS
Cover Parking Tool	QTH43A	1	Used to support the cover unit assembly on the housing unit	Stores Number 27B4850
Trap Tool	NS14995	2	Used to perform trap and vane test.	Tongue depresser may be used instead of.
Coin Leveling Tool	NE139B	3	Used to spread coins in coin box.	
Tool	P0896911	4	Used in removing hood and cover unit assembly.	Stores Number 81K2010
Tool	P0532301	5	Used in removing hood and cover unit assembly.	Where limited clearance prevents use of P0896911 tool. Stores number 81K2015.
Tool	KS16750	6	Used in removing finger wheel.	Stores Number 27T3000.
Orange Stick	NE6320		Used to remove stuck coins.	Stores Number 2701200.
Allan Wrench	5/32 inch		Used to remove lock	
Spirit Level			Used for vertical alignment of set.	

3.20 Test Equipment

NAME	NUMBER	FIGURE	USE	REMARKS
Butt-in			Used in fault clearing.	
Transmission Test Set	T136		Used for making transmission measurements.	
Multimeter	Analogue		Used in fault clearing.	Type 01

3.30 Materials

NAME	NUMBER	FIGURE	USE	REMARKS
Sign	QSW1A	8	Out of service sign.	Stores number 30S3935
Resistor	1000 ohm 10 Watt		Used for transmission tests.	
Clip Cords			Two cords with alligator clips on each end for fault clearing and testing.	
Lead Pencil	HB		Used to lubricate hopper trigger switch and coin release mechanism.	

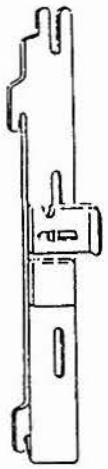


Fig. 1 Cover Parking Tool

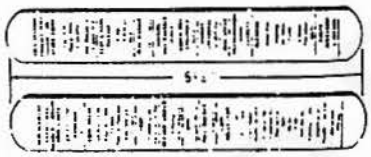


Fig. 2 Trap Tool

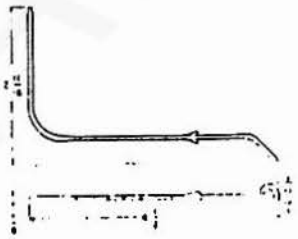


Fig. 3 Coin Leveling Tool

Fig. 4

Fig. 5

Fig. 6

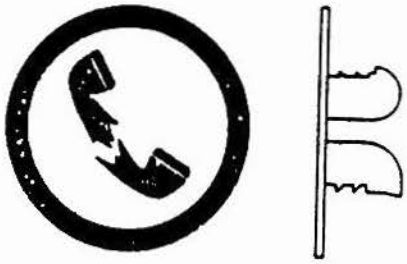


Fig. 8 Out Of Service Sign

4.0 FIELD REPLACEMENT PARTS

The routine tests and inspections will identify faulty components that are to be replaced. Table 4.1 is a list of parts considered to be field replaceable. Maintenance personnel are required to have these parts available on repair visits. The quantity of each part is to be determined locally based on repair frequencies. The quantity of parts listed in table 4.1 should serve as a guideline and adjusted accordingly to repair requirements.

TABLE 4.1 REPLACEMENT PARTS

ITEM	PART NUMBER	STORES NUMBER	QUANTITY
Apparatus Module	PO521257	81M7072	1
Coin Chute	NSQ1016L2/L4	81C3500	2
Coin Switch Module	PO523381	81M6800	1
Coin Relay Assembly	PO15E687	81C3535	2
Coin Return (Bucket) Assembly	PO15E491	81C3530	1
Coin Return Ramp	PO501274	80R3000	1
Dial and Housing Assembly (Rot)	PO500807	82D3040	1
Dial and Housing Assembly (T.T)	PO500808	82D3050	2
Dial Cover Spacer Plate (T.T)	PO51450	82C8236	1
*Dial - Touch Tone - Metal Button	215N	81D3383	1
Finger Wheel	PO892576	82F2710	1
*Handset - Standard Replacement Black - E/W 32" Armoured Cord With Steel Lanyard and Lanyard Bracket Hearing Aid Compatible	BL32W37	81S1167	2
*Handset - Drive-up Locations Only Black - E/W 54" Armoured Cord With Steel Lanyard and Lanyard Bracket Hearing Aid Compatible	BL54W59	81S1168	0
Handset - Noisy Locations Black - E/W Receiver Amplifier and 32" Armoured Cord Hearing Aid Compatible	WT3500T	81S0800C	0
*Hood Unit Assembly - Black-Rot Dial	PO5018	82H4099C	1
*Hood Unit Assembly - Black-T.T Dial	PO5019	82H4102	1
Hook - Handset	PO521251	82H1900	1
Hookswitch Dust Cover	PO500820	82C8236	1
Lock - Upper Housing	22QD	82L5575	1
Printed Circuit Board	PO535660	82B5340	1
Relay Dust Cover	PO10E783	82C8235	2
Ringer	NE-C4A	81R3650	1
Trap Lever Spring (Box of 50)	PO625882	40S6590	1
Window Number Card	PO501269	82W2340	2

* Denotes change this issue.

5.0 SEVEN STEP ROUTINE

The seven steps that comprise the prepay maintenance routine are described in Table 5.1. The time required to perform each step is also given in table 5.1. The times do not include the time required to correct faults detected when performing the tests and inspections.

The following guidelines have been established to identify when specific steps of the maintenance routine are to be completed:

a. Upon Installation - Steps 1, 2, 3, 4, 5, 6, 7.

b. Regular Repair Visits - Steps 1, 2, 3, 6, and 7.

c. Repair Visit of no coin collect/return - Steps 1, 2, 3, 5, 6, 7 and Step 4 if a repeat report of no coin collect/return.

d. Scheduled Routine Visit - Steps 1, 2, 7 and Steps 3, 4, 5, 6 if faults are detected in Steps 1, 2.

TABLE 5.0 SEVEN STEP MAINTENANCE ROUTINE

STEP	TITLE	DESCRIPTION	TEST TIME
1	Initial Set Inspection	Physical inspection of set before cover is removed.	2 min
2	Operational Tests	To verify operation of the set, loop and C.O. in providing coin service.	4 min
3	Internal Set Inspection	Check options, missing parts and wiring.	2 min
4	Transmission Tests	To verify loop design and signal ground.	5 min
5	Coin Relay and Hopper Tests	Verify operation of relay and coin hopper.	3 min
6	Final Tests and Inspections	Verify operation of set after repairs have been made.	3 min
7	Visual Inspection of Associated Items	Overall inspection of coin installation.	1 min

5.10 Step 1 Initial Set Inspection

The purpose of this step is to verify that all external components of the set are functional. Faults identified in this step must be cleared before proceeding to subsequent routine steps. A physical inspection of items listed below is required to complete this step.

a) set mounting
b) dial
c) hookswitch
d) release button
e) handset
f) armoured cord
g) coin return bucket
h) number card
i) instruction cards

Refer to table 5.1 for inspection details.

TABLE 5.1 INITIAL SET INSPECTION

INSPECT	VERIFICATION	REPAIR ACTION	REFERENCE
Set Mounting	Set is securely attached to backboard	Replace or tighten security studs and pan-head mounting screws.	Procedure Chart 1
	Backboard is securely attached to mounting surface	Replace or add additional fasteners to secure backboard to mounting surface.	
	Set mounted vertical	Remount or add shims as required to level set. Booth installations may require leveling of booth.	
Rotary Dial	Operates smoothly without binding, slipping or skipping.	Replace dial or dial and housing assembly.	Procedure Chart 8
	Finger wheel not cracked.	Replace finger wheel	
Touch-Tone Dial	Buttons not broken or mutilated.	Replace dial or dial and housing assembly.	Procedure Chart 8
	Buttons not sticking or binding.	Replace dial or dial and housing assembly.	
	Button markings are legible.	Replace dial or dial and housing assembly.	

TABLE 5.1 INITIAL SET INSPECTION (Continued)

INSPECT	VERIFICATION	REPAIR ACTION	REFERENCE
Hookswitch	Operates without binding or sticking. Cracked or Broken	If binding to hood, remount hood assembly or file hood opening to provide clearance Replace dial and housing assembly.	Procedure Chart 2 Procedure Chart 8
Coin Release Button	Operates freely without binding or sticking	Remove cover and inspect coin guide for freedom of movement. Manually operate coin release lever on coin chute. Replace if binding or sticking	Procedure Chart 11
Handset and Armoured Cord	Check for defaced handset, cracked or missing caps. Shake to detect internal damage and ensure armored cord is intact.	Replace handset and armored cord	Procedure Chart 3
Coin Return Bucket	Not blocked Door swings freely.	Remove obstruction Replace if damaged.	Procedure Chart 16
Number Card	Present and legible	Replace number card.	Procedure Chart 7
Instruction Cards	Securely in place. Information correct Not multilated.	Remount Replace	Procedure Chart 7

* Denotes change this issue.

5.20 Step 2 Operational Tests

The operational tests outlined in this step are unique to Full Prepay coin service as implemented by AGT (Full Prepay service provides dial tone first and coinless access to selected numbers). The tests described assume an initial rate charge of 25 cents. Note: Coins are required for testing - pennies, nickels, dimes and quarters.

TABLE 5.2 OPERATIONAL TESTS

TEST	PROCEDURE	VERIFICATION	REFERENCE
a. Dial Tone	1. With handset off-hook.	Dial tone should be heard in receiver.	Trouble Analysis 1
b. Coin Accepter (coin chute) and Coin Return	1. With handset off-hook.		
	2. Deposit nickel	Coin enters slot freely. Coin should not be rejected.	Trouble Analysis 2 or 3
	3. Depress hookswitch	Coin should return. NOTE: If no coin return see T.A. 4, if no coin return relay operates see T.A. 5.	Trouble Analysis 4 or 5
	4. Repeat 2 and 3 with dime and quarter.		
c. Coin Rejection	1. With handset off-hook. 2. Deposit penny	Coin should fall through to return bucket.	Trouble Analysis 6
d. Initial Rate Test	1. With handset off-hook		
	2. Deposit dime and two nickels.	Receiver muted during deposit.	Trouble Analysis 7
	3. Dial office milliwatt	Dial tone removed	Trouble Analysis 8
		Office returns fast busy (120 IPM)(Test fails if milliwatt connected).	Trouble Analysis 9
	4. Depress hookswitch	Coins returned	Trouble Analysis 4 or 5
e. Totalizer Test	1. With handset off-hook 2. Deposit quarter Dial number of payphone being tested.	Office returns busy (60 IPM)	Trouble Analysis 10

TABLE 5.2 OPERATIONAL TESTS (Continued)

TEST	PROCEDURE	VERIFICATION	REFERENCE
e. Totalizer Test (Cont.)	4. Depress hookswitch	Coins returned	Trouble Analysis 4 or 5
	5. Repeat with one of the following combinations. 2 dimes and 1 nickel 3 nickels and 1 dime		
f. Coin Collect	1. With handset off-hook 2. Deposit initial rate 3. Dial office milliwatt 4. Wait at least 3 seconds	Tone heard in receiver	
	5. Depress hookswitch	Coin collected	Trouble Analysis 4 or 5
g. Coin Tones and Ringback	1. With handset off-hook		
	2. Deposit 1 dime (do not use nickel or quarter for this test).		
	3. Dial 0	Dial tone removed Coin returned (No blind return)	Refer to CO Craft
		Operator answered Voice path established	Trouble Analysis 11
	4. Advise operator that this is a test call and their assistance is required.		
	5. Ask operator if Prepay header appears on screen	Prepay header on screen. (Incorrect ANI or trunk group assigned).	Refer to CO Craft
	6. Ask operator to identify coins.		
	7. Deposit nickel, dime and quarter.	Operator identifies coins correctly.	Trouble Analysis 12
	8. Ask operator to return coins.	Coins returned. (Defective Trunk to TOPS).	Refer to CO Craft
	9. Deposit nickel.		

TABLE 5.2 OPERATIONAL TESTS (Continued)			
TEST	PROCEDURE	VERIFICATION	REFERENCE
g. Coin Tones and Ringback (Cont.)	10. Ask operator to collect coin.	Coin Collected. (Defective trunk equipment).	Refer to CO Craft
	11.Ask operator to ringback station by operating ringback key 3 times.		
	12.Depress and hold hookswitch for 3 ring cycles.	Bells ring and volume suitable.	Trouble Analysis 13
	13.Release hookswitch	Verify ring trip	
		Voice path with operator established	Refer to CO Craft
	14. Advise operator that the testing is completed and call may be released.		
	15. Depress hookswitch for 3 seconds.		
	16. Release hookswitch	Verify dial tone is present. (Trunk not releasing).	Refer to CO Craft
	17.Restore handset.		

5.30 STEP 3 SET INSPECTION - INTERNAL

The purpose of this step is to identify and correct any set deficiencies that potentially may cause the set to fail. As a preparation to this step, the hood and cover unit assemblies must be removed as described in Procedure Chart 2. The cover unit maybe supported with the QTH43A parking tool.

This step requires the inspection of the following items:

1) Options
2) Apparatus module
3) Coin Box
4) Coin Chute
5) PCB
6) Coin Relay Switch Module
7) Coin Relay
8) Dial Assembly

TABLE 5.3 SET INSPECTION - INTERNAL			
INSPECT	VERIFICATION	REPAIR ACTION	REFERENCE
Options	Electronic coin totalizer and FASN conversions completed	Do converison	Procedure Chart 17
	Ground Isolation option installed	Install option if office compatible	Procedure Chart 17
Apparatus Module	Drop wire entrance and dressing.	Terminate and dress drop wire so that it is not in contact with coin chute, coin switch or coin relay assemblies.	
	Screw terminal connections on TB1 are tight and secure	Tighten as required	
	All plugs and cables are secure and not in contact with coin chute or coin relay.	Dress cables and use stay hooks provided to secure.	
Coin box	Check for coins backed up in hopper Check for full box	Level coins in box using leveling tool. Report full box to coin centre for collection.	
Coin Chute	Check for foreign matter and dirt.	Clean or replace. Clean by immersing in warm soapy water and agitating gently. Rinse with clean water and to shake remove excess. Allow time to drip dry.	Procedure Chart 11
PCB	If circuit design uses loop improvement (loop extender) check for compatibility.	Replace if necessary with compatible type.	Procedure Chart 10
	Card is fully seated into edge connector.	Reseat card inspect cover unit assembly for damaged or missing plastic retainer.	
	Edge connector secure	Tighten or replace missing screws.	

TABLE 5.3 SET INSPECTION - INTERNAL (Continued)			
INSPECT	VERIFICATION	REPAIR ACTION	REFERENCE
Coin Switch Module	Check that module is properly mounted and aligned with coin chute and coin hopper	Remount if necessary	Procedure Chart 13
Coin Relay	Check wiring for tight connections.	Tighten screw terminals	
	Check mounting for loose or missing screws.	Tighten or replace missing screws.	
	Check for dirty or burnt contacts.	Clean contacts or replace relay.	Procedure Chart 14
	Check for foreign material (iron fillings ect) on pole extensions and selector card.	Use orange stick with tape on end to remove material.	
	Deposit dime and verify hopper trigger fully tripped.	Use lead pencil to lubricate trigger switch. Tilt selector card to the right and manually operate relay to return dime. Repeat test if still fails replace relay.	Procedure Chart 14
	Check for dust cover	Replace dust cover if missing.	
Dial Assembly	Check mounting for loose screws	Tighten screws or replace missing screws.	
	Check hookswitch contacts for dirt	Clean contacts to remove dirt.	
	Check for Hookswitch dust cover.	Replace dust cover if missing.	
Coin Return Ramp	Check for proper installation or damage.	Replace if missing or damaged.	Procedure Chart 12

5.40 STEP 4 TRANSMISSION TESTS

The purpose of this step is to identify any deficiencies in loop design that may affect the operation of the set. The transmission tests consist of measuring loop current, noise, loss and station ground.

TABLE 5.4 TRANSMISSION TESTS

STEP	PROCEDURE	REQUIREMENT	REPAIR ACTION
	LOOP CURRENT		
1.	Remove hood and cover assemblies. NOTE: P2 is to be disconnected during tests.		
2.	Connect leads of T136 to the Tip, Ring and Ground screw terminals of TB1.		
3.	Connect 1000 ohm/10 watt resistor Tip to Ground.		
4.	Connect Butt-in to T136 and dial quiet termination.		
5.	Remove 1000 ohm resistor from Tip after ring trip.		
6.	Measure loop current	23 ma or greater	If current is less than 23 ma circuit requires installation of loop extender or loop extender is defective.
	GROUND TEST NOTE: The following test is not a measure of station ground resistance. The test will verify the presence of ground at the set which is less than 200 ohms.		
7.	Connect jumper from Ring to ground.	Meter reads less than 5 ma.	Check station ground.
8.	Remove jumper from Ring to ground.		

TABLE 5.4 TRANSMISSION TESTS (Continued)			
STEP	PROCEDURE	REQUIREMENT	REPAIR ACTION
	CIRCUIT NOISE		
9.	Measure noise (Nm)	less than 20 dBrnC	Refer to ATP 331-8409-901 Subscriber loop Noise Investigation.
10.	Drop connection to office quiet termination.		
	CIRCUIT LOSS		
11.	Connect 1000 ohm/10 watt resistor Tip to Ground.		
12.	Dial office milliwatt		
13.	Remove 1000 ohm resistor Tip to Ground after ring trip.		
14.	Measure circuit loss	less than 7.5 dB loss	If loss is greater than 7.5 dB, circuit requires installation of E6 repeater or E6 repeater is defective.
15.	Release connection		
16.	Remove T136 test leads		
17.	Install cover and hood assemblies.		

5.50 STEP 5 COIN RELAY AND HOPPER TESTS

The purpose of this step is to verify the operation of the coin relay and hopper assemblies. The tests will identity coin relays that are marginal in operation and defective trap lever springs. As a preparation to this step, the hood unit and cover unit assemblies must be removed. The cover unit maybe supported with the QTH43A parking tool.

TABLE 5.5 COIN RELAY AND HOPPER TESTS

STEP	PROCEDURE	FAULT	REMEDIAL ACTION
1	Remove hood and cover unit assemblies.		
2	Remove coin chute, coin return ramp, and coin switch module.		
3	Remove coin relay dust cover or guard. Caution: To prevent jamming of selector card and cam, the selector card is tilted by pressing downwards on one of the tabs on either side of the card before manually operating the coin relay.		
4	Press downward on left tab of selector card and manually operate coin relay armature to its full extent of travel. Coin vane moves to collect (left) position; coin trap moves downwards.		
5	With armature fully operated, insert NS14995 tool into hopper and operate the trap to the limit of its travel.		

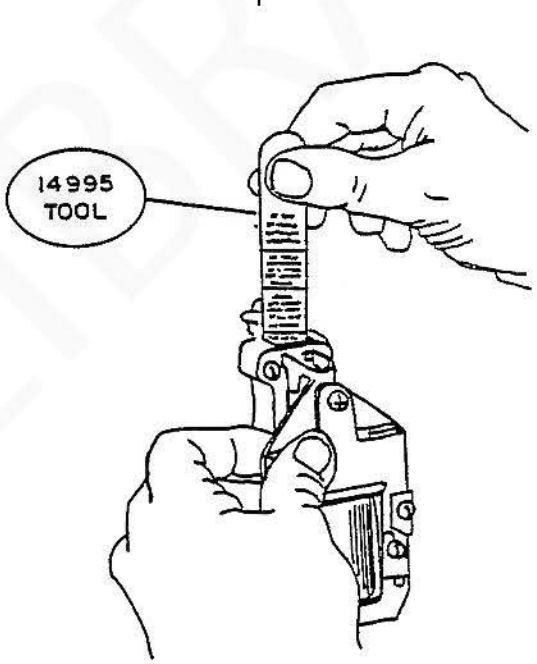


TABLE 5.5 COIN RELAY AND HOPPER TESTS (Continued)			
STEP	PROCEDURE	FAULT	REMEDIAL ACTION
6	Release armature and slowly withdraw tool. Armature, trap, and vane should return to nonoperated position and trap should be locked.	Armature, trap, or vane does not return to its normal position. Vane does not restore properly.	Relay could be mounted in a binding position. Loosen mounting screws and realign relay; tighten screws. Vane binds, remove coin relay and free vane. Vane broken, replace hopper and relay assembly.
7	Check if trap is locked by inserting NS14995 tool into hopper and apply firm downward pressure (approximately 1/2 pound) with tool on coin trap in hopper throat.	Trap not locked or perceptible movement of coin relay armature is detected.	Check for the following defective apparatus and replace as necessary. (a) broken trap. (b) bent or broken trap spring. (c) broken trap lever. (d) bent or broken trap pin.
8	Press downwards on right tab of selector card and manually operate coin relay armature to its full extent of travel. Coin vane moves to return (right) position; coin trap moves downwards.		
9	Repeat Steps 5, 6 and 7.		
10	Replace coin relay dust cover, or guard.		
11	Install coin switch module, coin return ramp and coin chute.		
12	Replace hood and cover unit assemblies.		

5.60 STEP 6 FINAL TESTS AND INSPECTION

The purpose of this step is to verify the overall operation of the set after repairs have been made and prior to placing the set in service. Before proceeding with this step the set must be assembled with the cover and hood assemblies in place.

TABLE 5.6 FINAL INSPECTION

INSPECT	VERIFICATION	REPAIR ACTION	REFERENCE
Dial	Finger wheel or buttons not binding to hood assembly.	Remount hood assembly	Procedure Chart 2
Hookswitch	Operates without binding to cover.	Remount hood assembly	Procedure Chart 2
Coin Release Button	Operates freely	Remove cover assembly and inspect.	Trouble Analysis 3

TABLE 5.6 FINAL TESTS

TEST	PROCEDURE	VERIFICATION	REFERENCE
Dial Tone Test	1. With handset off-hook.	Dial tone should be heard in receiver and side tone present.	Trouble Analysis 1
Initial Rate Test	1. With handset off-hook.		
	2. Deposit initial rate less 5 cents.		
	3. Dial office milliwatt.	Dial tone removed.	Trouble Analysis 8
		Office returns fast busy (120 IPM)	Trouble Analysis 9
	4. Depress hookswitch	Coins returned	Trouble Analysis 4 or 5

TABLE 5.6 FINAL TESTS (Continued)			
TEST	PROCEDURE	VERIFICATION	REFERENCE
Totalizer Test	1. With handset off-hook.		
	2. Deposit quarter		
	3. Dial milliwatt number	Tone heard in receiver	Trouble Analysis 10
	4.Depress hookswitch.	Coin Collected	Trouble Analysis 4 or 5
Coin Tones and Ringback	1. With handset off-hook.		
	2. Dial 0	Operator answer.	Refer to CO Craft
	3. Ask operator to identify coins.		
	4. Deposit nickel dime and quarter.	Operator identifies coins correctly.	Trouble Analysis 12
	5. Ask operator to return coins.	Coin returned	Refer to CO Craft
	6. Ask operator to ringback station..		
	7. Depress hookswitch	Bells ring.	Trouble Analysis 13
	8. Release hookswitch	Ring Trip	
	9. Advise operator that the testing is completed and the call may be released.		

5.70 STEP 7 VISUAL INSPECTION OF ASSOCIATED ITEMS

The purpose of this step is to ensure the overall condition of the installation is maintained. This step lists a number of items to be checked in order to maintain appearance and service to the public. Table 5.7 provides the inspection details.

TABLE 5.7 VISUAL INSPECTION OF ASSOCIATED ITEMS			
INSPECT	VERIFICATION	REPAIR ACTION	REFERENCE
Booth/ Shelf	Properly anchored and grounded.	Anchore and ground as required.	
Glass	Glass intact	Remove and replace broken glass	
	Glass clean	clean glass to remove dirt or graffiti.	
Booth Door	Closes and opens without binding	Make repairs or adjustments necessary.	
Light Fixtures	Light Working	Replace defective lamp.	
Directories	Applicable for station location	Replace directory	
	Current issue	Replace directory	
	Missing or mutilated	Replace directory	
Signs	Securely mounted	Remount or replace.	
	clean	Clean and remove graffiti.	
Public Access and Safety	Visibility to public Accessibility to public Adequacy of lighting Degree of privacy Level of noise or vibration. Clearance from: -moving machinery or vehicles. -opening doors -stairways	Note any changes at the station location that may affect public safety or access to the paystation and report situations to the appropriate Coin Centre.	
Vandalism		Installations that experience a high incidence of vandalism should be identified to the Coin Centre for further action.	

6.0 Trouble Analysis Index

6.1 Trouble Analysis Table

1. No Dial Tone
2. Can't Deposit
3. Coins Rejected
4. No Coin Collect/Return (relay does not operate)
5. No Coin Collect/Return (relay operates)
6. No Coin Rejection
7. Coin Tones Not Mutted
8. Can't Break Dial Tone
9. Calls Made For Less Than Initial Rate
10. Can't Make Local Calls
11. Can't Be Heard
12. No Coin Tones
13. No Ringing Or Low Volume Ringing.

6.2 Trouble Flowcharts

a. No Dial Tone

b. No Coin Collect/Return

6.3 Wiring Diagrams

Fig. 1 Connection Diagram - QSD400A and 2400A Coin Telephone Sets

Fig. 2 Schematic Diagram of QSD400A Coin Telephone Set

Fig. 3 Schematic Diagram of QSD2400A Coin Telephone Set.

6.10 TROUBLE ANALYSIS TABLE

NOTE: This table is referred to in Steps 2 and 6 of the Seven Step Coin Routine. The trouble analysis table should not be used by itself as a repair aid. For effective repair, use table as directed when completing Steps 2 and 6 of the Seven Step Coin Routine.

TABLE 6.1 TROUBLE ANALYSIS TABLE

No	TROUBLE	POSSIBLE CAUSE	VERIFICATION	REMEDIAL ACTION
1	No Dial Tone	Fault on C.O. line	Use butt-in to verify dial tone to set. Test at TB1, protector block or pedistal.	Clear loop fault or refer to C.O. craft for test. NOTE: Coin set requires loop start line treatment and not ground start.
		Set faults include hookswitch, dial, receiver, PCB, coin switch module, apparatus module wiring or connector plugs.	Check for full coin box and coins backed up into hopper, coin switch module or coin chute.	Clear stuck coins (Procedure Chart 18) and report full box to Coin Centre.
			Check if all connector plugs are fully seated.	Reseat all connector plugs and check for dial tone.
			If still no dial tone use trouble flowchart A to to isolate set fault.	Replace faulty components identified in flowchart test.
2	Can't Deposit	Stuffed coin slot.	Remove hood and cover unit assemblies (Procedure Chart 2) and check for foreign material in slot.	Remove foreign material from coin slot.
3	Coins Rejected (coins fall through to return bucket when deposited).	Defective coin chute	Remove and inspect coin chute (Procedure Chart 11)	Clean or replace coin chute and retest. (If release lever mechanism sticks or binds, replace coin chute).

TABLE 6.1 TROUBLE ANALYSIS TABLE				
No	TROUBLE	POSSIBLE CAUSE	VERIFICATION	REMEDIAL ACTION
3	Coins Rejected (coins fall through to return bucket when deposited). Con't.	Coin release button stuck	Verify coin release button is not stuck or sticking when operated.	Lubricate button shaft and guide with graphite or soft lead pencil. NOTE: Do not lubricate with oil or grease.
		Set not vertical	Verify set is mounted vertical (Procedure Chart 1).	Remount set or level booth.
4	No Coin Collect/ Return (coin relay does not operate).	Loop reversal	Test for loop reversal. For rotary dial set use butt-in or multimeter to test for battery on Ring. For Touch Tone dial verify dial works. (T.T. dial is disabled on loop reversal).	Correct loop reversal and retest.
		Wrong data mod. (line not given coin class of. service).	Determine if local calls can be made with butt-in (set disconnected).	Refer to C.O. craft if local call completes.
		Incorrect options installed is set.	Verify options. Check for G.I. option being compatiable with C.O. switch type.	Refer to Procedure Chart 17 for correct options.
		Hopper Trigger Switch not tripped.	Remove hood and cover unit assembly. Remove relay dust cover and verify coin reached hopper and fully trips trigger switch.	Refer to Procedure Chart 2 Refer to Procedure Chart 18 to clear stuck coins.
			Test trigger switch operation by depositing dime.	If trigger switch does not fully trip replace coin relay. (Procedure Chart 14).

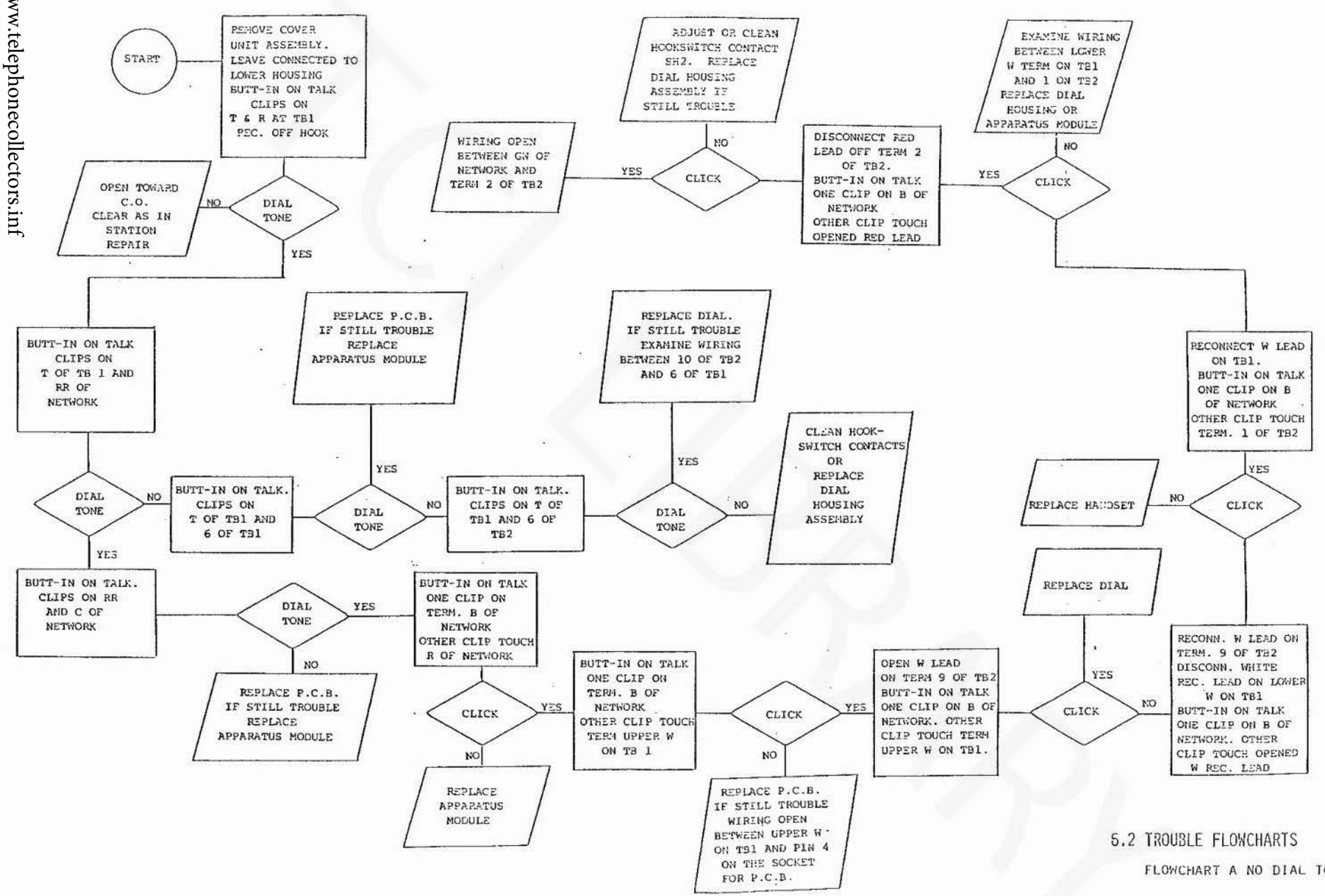
TABLE 6.1 TROUBLE ANALYSIS TABLE				
No	TROUBLE	POSSIBLE CAUSE	VERIFICATION	REMEDIAL ACTION
4	No Coin Collect/ Return (coin relay does not operate). Con't.	Trigger Switch contacts dirty or burnt.	Inspect and clean contacts.	Replace coin relay if contacts are burnt (Procedure Chart 14).
		No station ground or poor station ground.	Preform ground test described in Step 4 of Coin Routine.	Correct defective station ground.
		Incorect type or defective loop extender (long loops or rural installations only).	The following types of Lorain Loop Extenders are compatiable with prepay coin service. 4338-150 4338-169 UM 2500	Refer to C.O. craft. Replace loop extender if not compatiable or defective.
		Set faults include coin relay, PCB or apparatus module.	Verify PCB and all connectors are fully seated. Use flowchart B to identify faulty component.	Replace defective component and retest.
5	No Coin Collect/ Return (coin relay operates).	Coin relay installed incorrectly.	Verify relay is installed correctly. (Procedure Chart 14).	Install relay correctly.
		Defective trap, trap lever, trap spring or vane.	Perform STEP 5 of coin routine.	Replace trap lever spring if required (Procedure Chart 15) For defective trap lever or vane replace set.
6	No Coin Rejection (penny deposit).	Defective coin chute.	Remove coin chute and inspect. (Procedure Chart 11).	Replace or clean coin chute.
		Coin return ramp missing or installed incorrectly.	Inspect set for missing ramp and proper installation (Procedure Chart 12).	Install ramp and retest.

TABLE 6.1 TROUBLE ANALYSIS TABLE

No	TROUBLE	POSSIBLE CAUSE	VERIFICATION	REMEDIAL ACTION
7	Coin Tones Not Mutted	PCB (NOTE: with impaired hearing handset coin tones are not mutted).	Receiver circuit not being opened when coins are being deposited.	Replace PCB and retest. (Procedure Chart 10).
8	Can't Break Dial tone	Dial	Check for loop reversal or set wiring if a Touch Tone dial is used.	Replace dial (Procedure Chart 8).
		Set optioned incorrectly.	Check wiring and straping options described in Procedure Chart 17	Install correct options.
9	Calls made for less than initial rate. NOTE: If coin Collect/ Return also fails refer to Trouble Analysis 4 first.	PCB	Check PCB for correct options (Procedure Chart #17). NOTE: If loop extender is used in circuit design, check PCB type and issuse for compatibility with loop extenders.	Install correct options and retest If calls are still placed for less than the initial rate, replace PCB (Procedure Chart 10). NOTE: When new PCB is installed, circuit logic card must be reset with coin collect or return signal before retesting initial rate on local calls.
		Tip of loop grounded.	Disconnect set and have loop tested for foreign ground	Clear grounded loop.
		Coin relay	Coin relay contact not resetting PCB logic circuit.	Clean relay contacts or replace coin relay. (Procedure Chart 14).
10	Can't make local calls	PCB	Wrong initial rate selected.	Check rate selected (Procedure Chart 17).

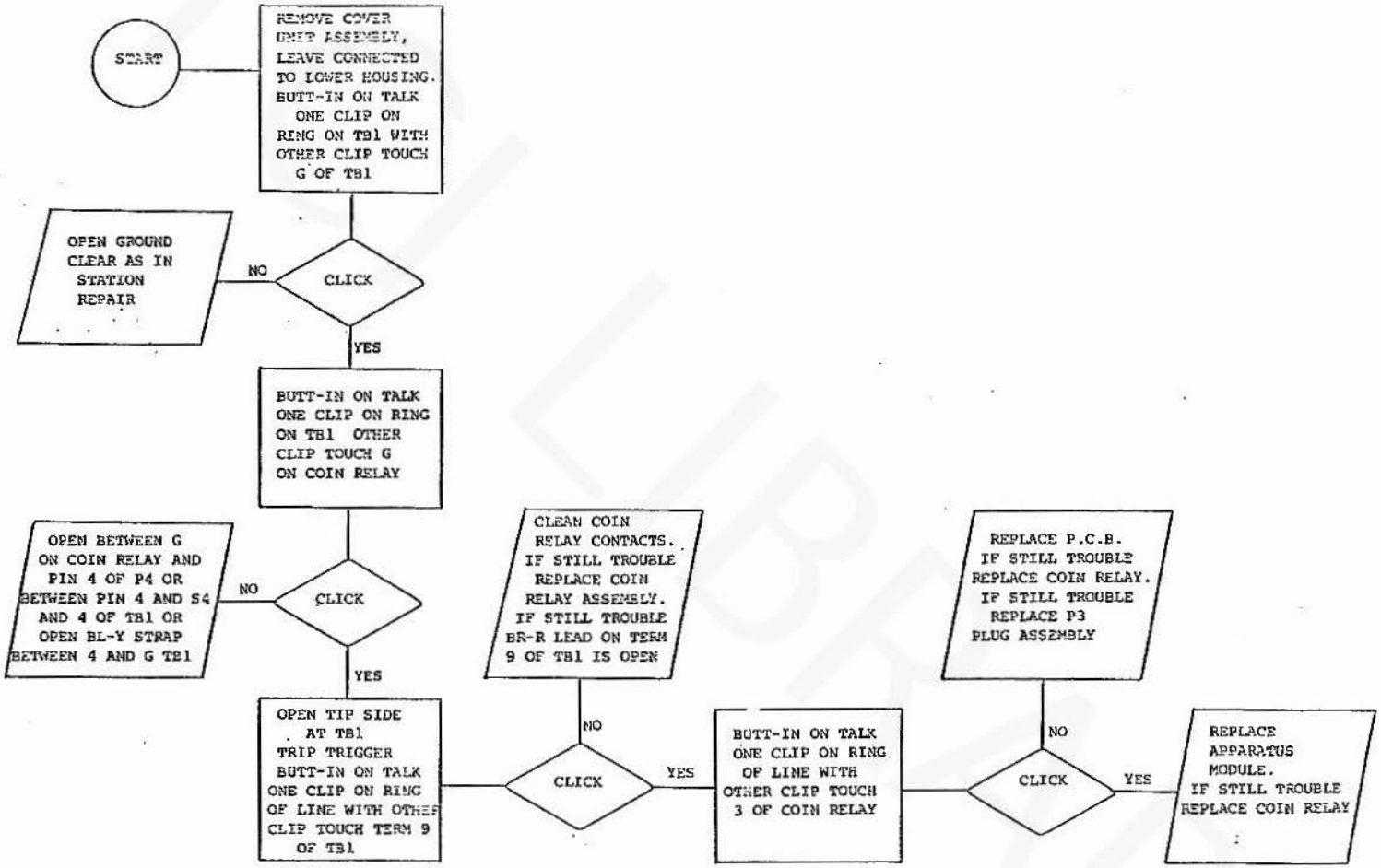
TABLE 6.1 TROUBLE ANALYSIS TABLE				
No	TROUBLE	POSSIBLE CAUSE	VERIFICATION	REMEDIAL ACTION
10	Can't make local calls Con't.	PCB	Defective PCB	Replace PCB (Procedure Chart 10).
		Ground Isolation option (G.I.)not compatiable with office type or loop extender.	Check for G.I. option compatability.	Remove option and retest. (Procedure Chart 17).
		Station ground open or high resistance.	Preform ground test in Step 4 of coin routine.	Repair station ground.
		Coin Switch Module	Defective microswitch.	Replace coin switch module (Procedure Chart 13).
		Hopper Trigger not tripped or contact dirty/burnt.	Verify if coin relay operates and if trigger switch is fully tripped.	Clean contacts or lubricate trigger switch and retest. If still trouble, replace coin relay (Procedure Chart 14).
11	Can't be heard.	Transmitter	Check for missing transmitter.	Replace missing or defective transmitter. (Procedure Chart 4).
		Handset	Open or shorted cord.	Replace handset and cord (Procedure Chart 3).
		PCB	Defective Card	Replace PCB (Procedure Chart 10).
		Apparatus Module	Check wiring on TB1 and network for proper and secure connections	Replace apparatus module. (Procedure Chart 5).
		Circuit requires loop improvement.	Perform transmission tests in Step 4 of routine.	Refer to C.O. if current or loss is out-of-limits.

TABLE 6.1 TROUBLE ANALYSIS TABLE				
No	TROUBLE	POSSIBLE CAUSE	VERIFICATION	REMEDIAL ACTION
12	No coin tones.	PCB	Defective PCB	Replace PCB (Procedure Chart 10).
		Coin Switch Module	Defective coin switch module.	Replace coin switch module. Procedure Chart 13).
13	No ringing or low volume ringing.	Ringer	Ringer defective or requires adjustment.	Replace or adjust ringer (Procedure Chart 9).
		C.O.	Test for ringing on loop.	Refer to C.O. craft.
			Coin line given deny termination treatment.	Deny termination treatment should not a affect operator rering.



5.2 TROUBLE FLOWCHARTS

FLOWCHART A NO DIAL TONE



6.2 TROUBLE FLOWCHARTS

FLOWCHART B NO REFUND OR COLLECT

30

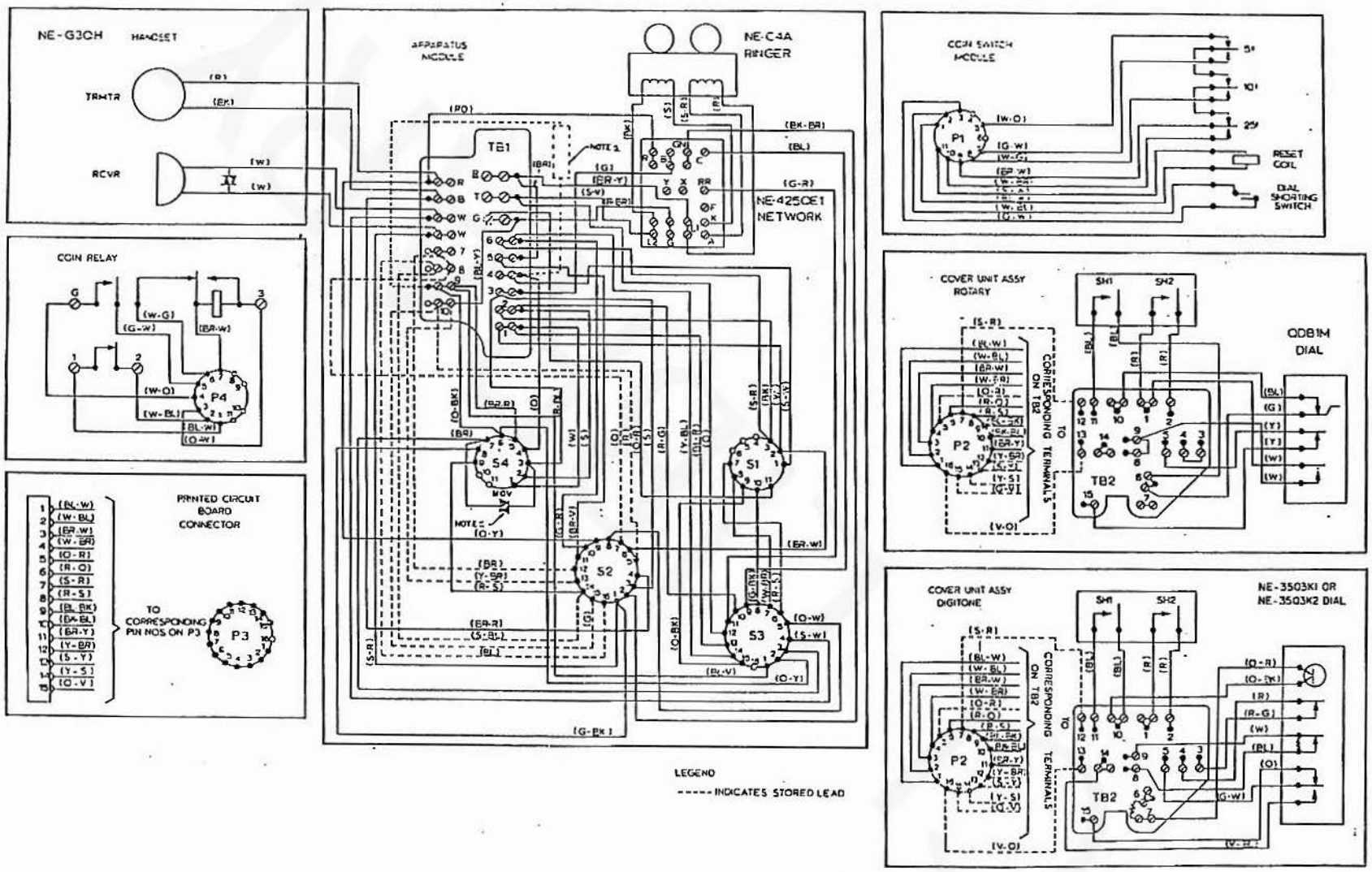
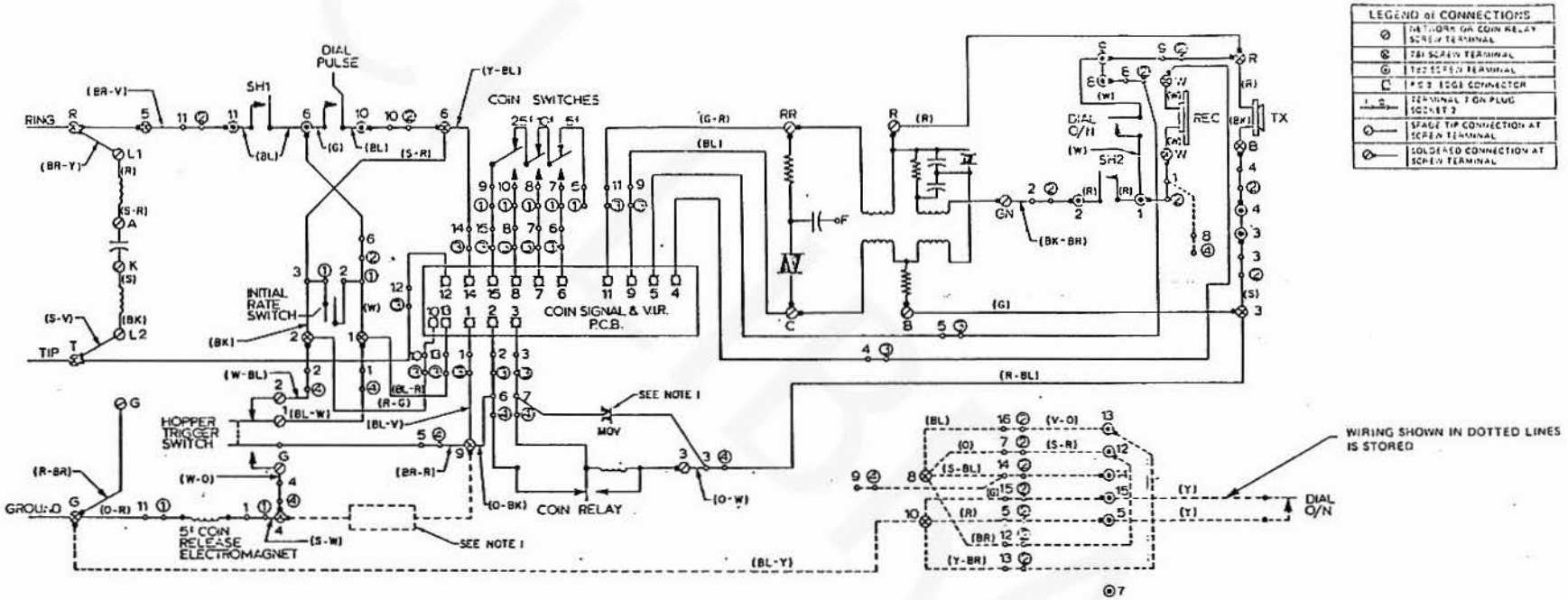


Fig. 1 – Connection Diagram – QSD400A and QSD2400A Coin Telephone Sets



NOTES:
1. SETS ARE EQUIPPED WITH 0.. MF. CAPACITATOR OR NE-185A NETWORK PRIOR TO AUGUST , 1976. AFTER AUGUST, 1976 SETS ARE EQUIPPED WITH METAL OXIDE VARISTOR (MOV.)

Fig. 2 – Schematic Diagram of QSD400A Coin Telephone Set

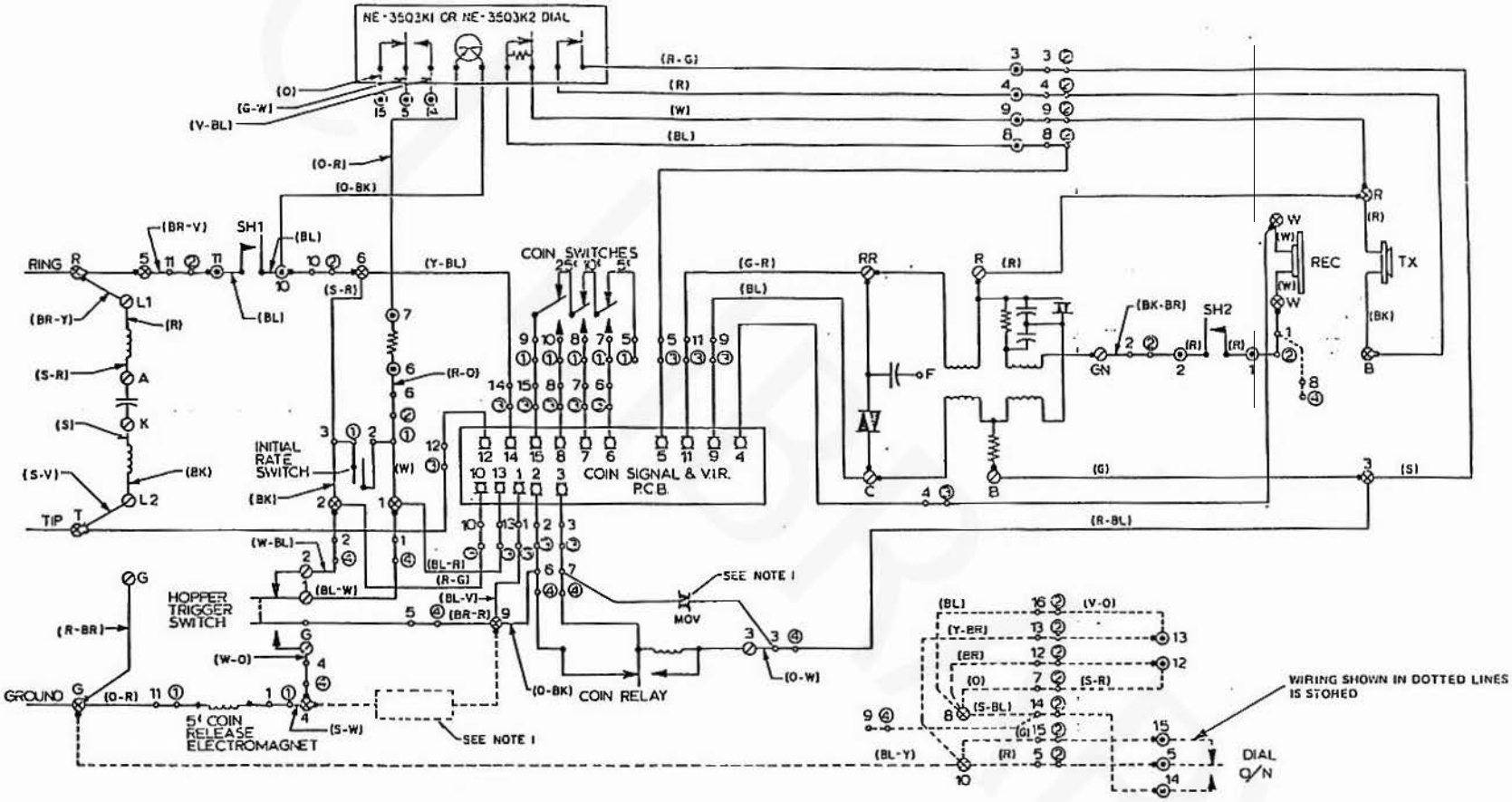


Fig. 3 – Schematic Diagram of QSD2400A Coin Telephone Set

7.0 REPAIR PROCEDURE CHARTS

PROCEDURE CHART INDEX

* Denotes change this issue.

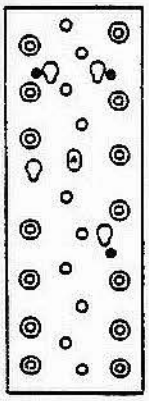
PROCEDURE CHART 1 - SET MOUNTING

STEP	PROCEDURE
	WALL MOUNTED WITH QBA3A BACKBOARD
1	Place mark on wall 54" from floor.
2	Place station wiring through wiring access hole of the backboard.
3	Select the appropriate type of fasteners from table.

Mounting Surface	Hole Size Required	Size and Type of Fasteners	Minimum Number of Fasteners
Softwood	1/8 inch or No. 30	1-3/4 inch No 14 FH wood screw	7
Hardwood	1/8 inch or No. 30	1-1/4 inch No 14 FH wood screw	7
Masonry Concrete Brick	5/16 inch	2 inch No. 14 FH wood screw No. 16 plastic anchor	7
Cinder Block Hollow Tile	3/4 inch	1/4 X 4 inch R.H. Toggle bolt	6

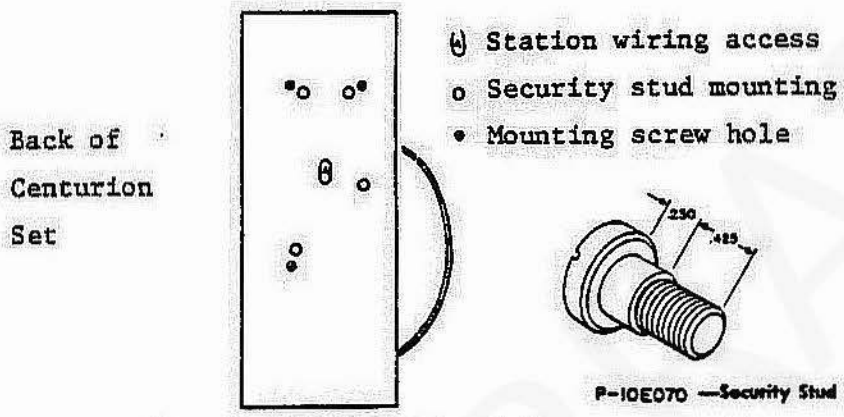
4	Locate top edge of the backboard on the mark and secure with one fastener.
5	Move backboard to the vertical position as checked with spirit level and mark the position.
6	Mark fastener locations and pre drill holes required as shown in figure.

QBA3A



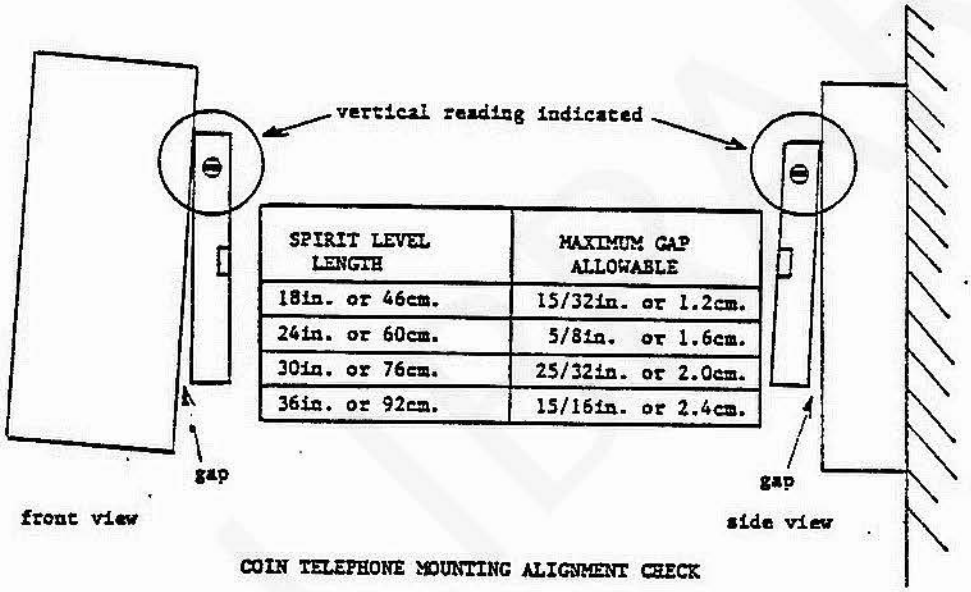
- Ⓐ Wiring entrance hole
- ◎ Large fastener hole
- o Small fastener hole
- • Pan-head machine screw for securing set to backboard

PROCEDURE CHART 1 - SET MOUNTING (Continued)	
STEP	PROCEDURE
7	Place remaining fasteners in the backboard.
8	Remove the hood and cover unit assembly as described in Chart 2.
9	Insert four P010E070 security stubs in the threaded holes in the back of the telephone set a shown in figure.



10	Insert station wire through the wiring access hole in the coin telephone set housing.
11	Engage the security studs at the back of the set in the keyhole slots of the backboard and allow the set to slide down into position.
12	Remove the apparatus module as described in Chart 3.
13	Remove the PCB assembly by grasping the upper and lower corners of the circuit board and pulling forward. Caution: Some components on the PCB are suceptible to damage by static electricity. Touch the metal case of the set to discharge any static electricity before removing or replacing the PCB or before moving the initial rate lead. The initial rate lead must be connected at all times except to change the initial rate.

PROCEDURE CHART 1 - SET MOUNTING (Continued)	
STEP	PROCEDURE
14	Fasten the set to the backboard with three pan-head machine screws (1/4 inch no. 20) 1/2 inch in lenght.
15	Replace apparatus module and PCB assembly.
16	Replace hood and cover unit assembly.
17	Check set mounting with spirit level as shown in figure.



SPIRIT LEVEL LENGTH	MAXIMUM GAP ALLOWABLE
18in. or 46cm.	15/32in. or 1.2cm.
24in. or 60cm.	5/8in. or 1.6cm.
30in. or 76cm.	25/32in. or 2.0cm.
36in. or 92cm.	15/16in. or 2.4cm.

COIN TELEPHONE MOUNTING ALIGNMENT CHECK

CHART 2 - REMOVAL OF HOOD AND COVER UNIT ASSEMBLIES	
STEP	PROCEDURE
	HOOD UNIT ASSEMBLY
1	Remove handset from hook.
2	Insert P0896911 tool into hood lock at the top of the set as shown.
3	Unlock by rotating tool 1/4 turn in either direction.
4	Tilt hood slightly foreward and remove by lifting upward and foreward.
5	Return hood lock to locked position to remove tool.
	COVER UNIT ASSEMBLY
6	Unlock NE22QD lock on left side of cover unit assembly. (Use #30913 key).
7	Insert P0896911 tool in key hole located above NE22QD lock as shown:

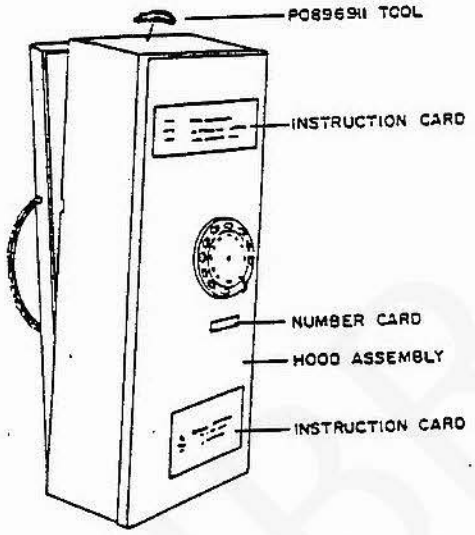


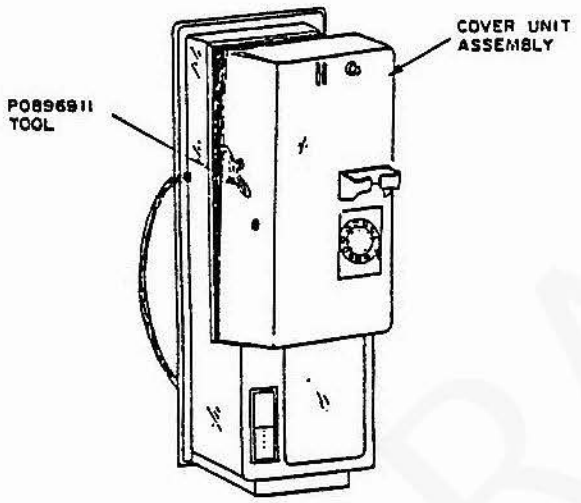
CHART 2 - REMOVAL OF HOOD AND COVER UNIT ASSEMBLIES (Continued)	
STEP	PROCEDURE
	
8	Rotate tool counterclockwise approximately 1/16 to release locking mechanism. Caution: The cover unit assembly cannot be completely removed until plug 2 is disengaged from jack 2 inside the set. This also removes battery from PCB.
9	Grasp cover unit assembly firmly by both sides and slide if forward until cover unit is clear.
10	Support cover unit assembly while disconnecting plug 2.
11	Remove rubber spacer between the PCB assembly and coin chute if present. Discard spacer (this spacer is required for protection during transportation only).
12	Remove P0896911 tool by restoring cover unit lock system to locked position.
13	Replace hood and cover unit assembly by reversing above procedure.

CHART 3 - SUBSTITUTION OF HANDSET	
STEP	PROCEDURE
	NOTE: The NE-G3QH6 Brown and Blue handsets are to replaced with Black vandal resistant handsets. The Black handset is a complete and sealed unit preventing replacement of caps, armored cord, transmitter and receiver. Upon failure of any components the entire handset must be replaced. The new Black handsets have a steel lanyard for added pull strength and will require a special bracket (included) for securing the lanyard to the set.
1	Remove hood and cover assembly described in Chart 2.
2	Remove PCB assembly with caution as described in Chart 10.
3	Remove coin chute as described in Chart 11.
4	Disconnect the handset leads from TB1.
5	Remove cord from the plastic wiring clamps.
6	Completely loosen screws on cord clamp. The screws should remain with the clamp for ease of replacement.
7	The cord clamp is disengaged from the armoured cord by sliding the clamp forward until the armoured cord enters the large end of the key hole opening. The clamp may then be pulled end wise off the armoured cord. The screws may be removed from the clamp and used for mounting the new lanyard style bracket described in Chart 4. Once the screws have been removed, the cord clamp can be discarded.
8	With the cord clamp removed, the handset can be removed by pulling the armoured cord through the cord tube assembly. The cord tube assembly must be retained for installation of a handset equipped with the steel lanyard.
9	Refer to Procedure Chart 4 for instructions on installing a new handset equipped with the steel lanyard.

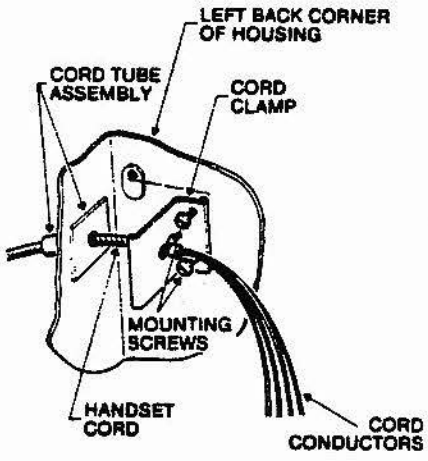
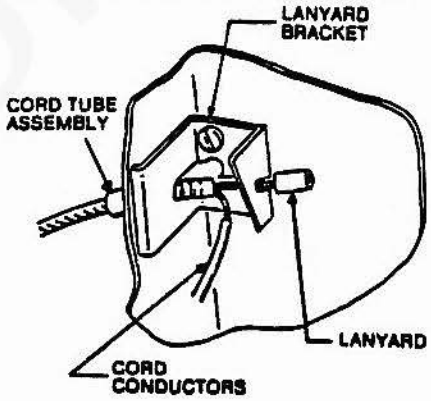


CHART 4 - LANYARD HANDSET INSTALLATION

STEP	PROCEDURE
	NOTE: Installation of a lanyard equipped handset will require a lanyard mounting bracket. The lanyard bracket is packaged with all new handsets. Depending on suppliers, the bracket style will vary. Two common bracket styles are shown below.
1	Remove the printed circuit board and the coin chute to allow access to the cord clamp arrangement.
2	Disconnect the handset wiring from the terminal board.
3	Remove the two mounting screws and the cord clamp. Remove the cord from the housing, leaving the cord tube assembly in place in the side of the housing. (Referrence Chart 3)
4	Insert the two screws removed in Step 3 into the new bracket.
5	Feed the end of the lanyard-equipped handset cord, lanyard first, through the cord tube assembly until the hose projects inside the housing. Slip the end of the lanyard through the keyhole opening of the new bracket and slide the flat area of the cord up the slot in the bracket.
6	Place the lanyard bracket in position in the housing and tighten screws one turn.
7	Align the retention flats on the cord with the keyhole and ensure the lanyard end remains in the anchoring slot when tightening the screws.
8	Connect handset wiring at the terminal board (TB1) and stretch the handset cord to anchor the lanyard by pulling on the handset. Use plastic stay clips to prevent cord conductors from interfering with other assemblies.
9	Replace the coin chute and printed circuit removed in Step 1 and discard old cord clamp.



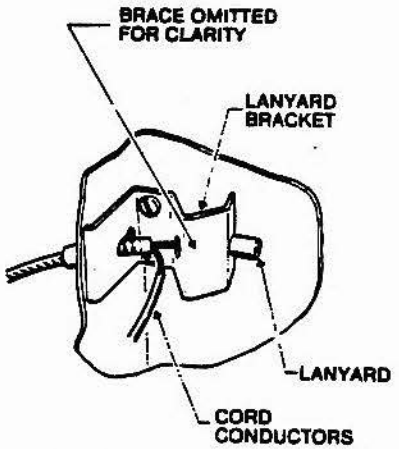


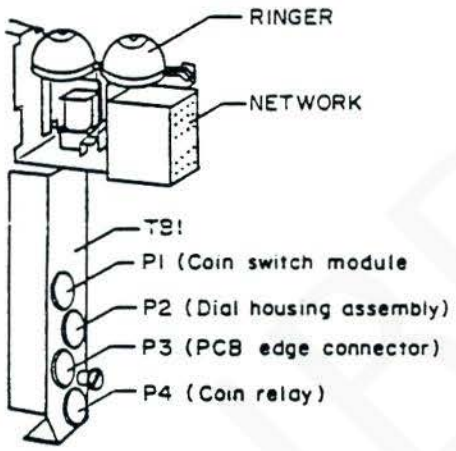
CHART 5 - REMOVAL AND REPLACEMENT OF APPARATUS MODULE	
STEP	PROCEDURE
1	Remove hood and cover unit assemblies as described in Chart 2.
2	Remove plugs 1, 3, and 4 from jacks on apparatus module.
3	Disconnect handset leads from terminals on terminal strip TB1.
4	Disconnect station wiring leads from terminals T, R, and G on TB1.
5	Completely loosen captive screw located between jacks 2 and 4.
	
6	Pull lower end of module forward, approximately 1/4 inch and lower the module until upper end of module mounting bracket is clear of locating slots in housing mounting plate.
7	Pull module forward carefully to avoid unnecessary interference with chute mounting bracket or coin relay.
8	Replace apparatus module by reversing above procedure.

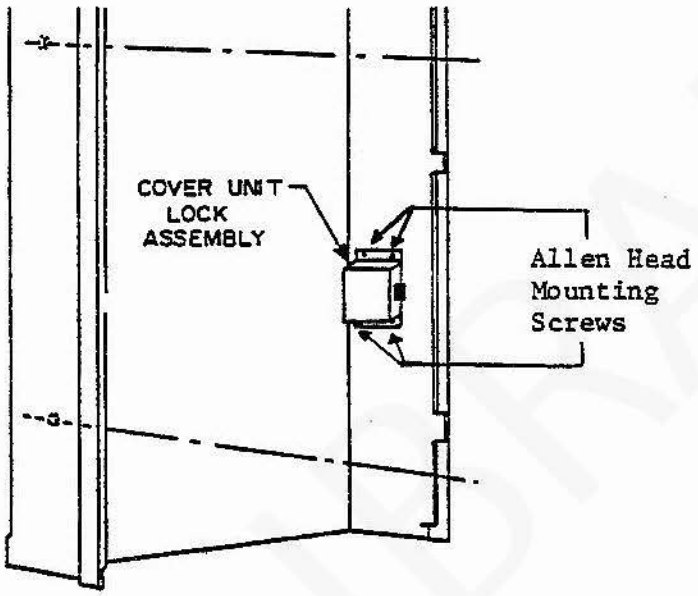
CHART 6 - INSTALLATION AND REMOVAL OF COVER UNIT ASSEMBLY LOCK	
STEP	PROCEDURE
1	Remove hood and cover unit assemblies as described in Chart 2.
2	Ensure that lock is operational.
3	Remove four Allen head screws, adjacent to lock location hole on inside of cover unit assembly with 5/32 inch Allen wrench.
	
4	Place cover unit assembly locking bolts in locked position.
5	Lock NE-22QD lock and remove key.
6	Align lock with hole and four screw holes in cover.
7	Insert four Allen head screws and tighten them with 5/32 inch Allen wrench.
8	Remove lock by reversing above procedures.

CHART 7 - INSTALLATION AND REMOVAL OF INSTRUCTION AND NUMBER CARDS	
STEP	PROCEDURE
	INSTRUCTION CARDS
1	Remove hood assembly as described in Chart 2.
2	Remove clear plastic window and metal retaining plate by pressing inwards on center of outer surface of window. This pressure causes the window and plate to disengage from inside of the hood.
3	Insert or remove instruction card between window and retaining plate. Insert one end of assembly in the window opening and bow the assembly inwards to spring the opposite end into position. NOTE: Refer to Coin Service Manual part 1 to identify upper and lower instruction cards for paystation location.
	NUMBER CARD
4	Grasp center edges of retaining plate, located inside hood, and pull until retaining plate is disengaged from flange at each end.
5	Insert or remove number card behind plastic window.
6	Insert one end of retaining plate in position, bow plate and spring opposite end into position.

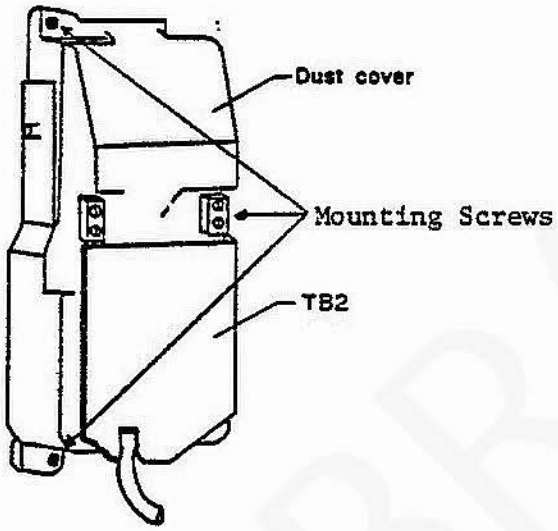
CHART 8 - SUBSTITUTION OF DIAL HOUSING ASSEMBLY AND DIAL	
STEP	PROCEDURE
1	Remove hood and cover unit assemblies as described in Chart 2.
2	Remove 3 mounting screws located at the top, side and base of dial and housing assembly. 
3	Lift dial and housing assembly from cover.
4	With dial, and housing assembly removed, proceed with removal of dial.
5	Loosen screws on side of dial. Do not remove screws from dial mounting.
6	Disconnect dial leads on TB2 as follows. **Rotary Dial** (a) Y lead on terminal 15 (b) Y lead on terminal 5 (c) W lead on terminal 1 (d) W lead on terminal 9 (e) G lead on terminal 6 (f) BL lead on terminal 10

CHART 8 - SUBSTITUTION OF DIAL HOUSING ASSEMBLY AND DIAL (Continued)

STEP	PROCEDURE

Northern Electric
Touch Tone Dial (Plastic Button)

(a) O-R lead on terminal 7
(b) O-BK lead on terminal 10
(c) R lead on terminal 4
(d) R-G lead on terminal 3
(e) W lead on terminal 9
(f) BL lead on terminal 8
(g) O lead on terminal 15
(h) G-W lead on terminal 5
(i) V-BL lead on terminal 14

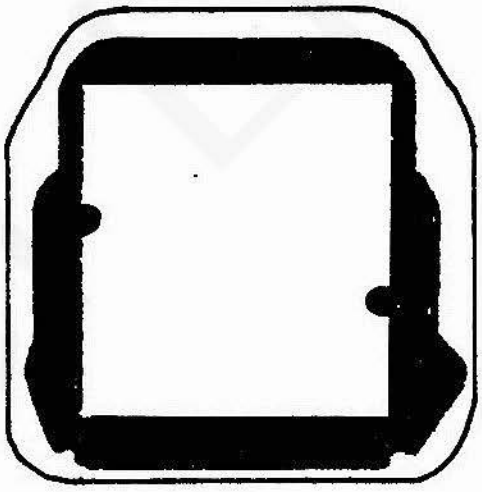
Phillips & Brooks
Touch Tone Dial (Metal Button)

(a) R-G lead on terminal 3
(b) O-R lead on terminal 3
(c) R lead on terminal 4
(d) O-BK lead on terminal 10
(e) BK or Blue lead on terminal 8
(f) W lead on terminal 9
(g) Y lead on terminal 6

7 Pry dial bracket on one side of dial with a screwdriver and free two bosses from the aligning holes on the bracket.

8 Tilt dial slightly and lift dial from housing assembly. If replacing dial, press on dial to engage the two bosses in the aligning holes on the bracket.

9 Replace dial in the housing assembly by performing Steps 1 through 8 in the reverse order. Ignore instructions given in Step 8 when replacing dial. Ensure that Digitone dial guard is in position prior to replacing dial housing assembly. The dial guard must be removed if a metal button touch tone dial has been installed.



Digitone Dial Guard

10 Replace hookswitch dust cover if removed.

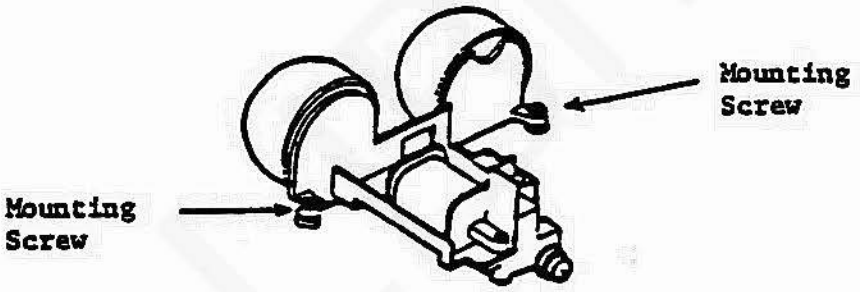
CHART 9 - SUBSTITUTION OF RINGER NE-C4A	
STEP	PROCEDURE
1	Remove hood and cover unit assemblies as described in Chart 2.
2	Remove apparatus module as described in Chart 5.
3	Remove ringer leads on the NE-425QE1 network from following terminals: (a) R lead on terminal L1 (b) BK lead on terminal L2 (c) S lead on terminal K (d) S-R lead on terminal A
4	Loosen 2 captive screws on side of gongs so ringer is disengaged from apparatus module framework. 
5	Pull ringer away from apparatus module to free prong at top of ringer from rubber grommet.
6	Replace NE-C4A ringer on apparatus module by performing Steps 1 through 5 in the reverse order.

CHART 10 - SUBSTITUTION OF THE PCB ASSEMBLY	
STEP	PROCEDURE
1	Remove hood and cover unit assembly as described in Chart 2.
2	Plug 2 must be disconnected when PCB assembly is removed or inserted.
3	Grasp front edge of PCB assembly at top and bottom. Do not apply pressure on components on PCB assembly. Caution: Some components on the PCB are susceptible to damage by static electricity. Touch the metal case of the set to discharge any static electricity before removing or replacing the PCB or before moving the initial rate lead. The initial rate lead must be connected at all times except to change the initial rate.
4	Pull PCB assembly outward.
5	Indentify PCB part number and note P0521260 PCB must be replaced by P0535660 Issue 6 or newer when loop extenders are employed in the circuit design.
6	Insert PCB assembly with components facing coin chute and lever assembly.
7	Insert PCB assembly in connector in the housing unit assembly.
8	Reconnect plug 2 to jack 2 on apparatus module.

CHART 11 - SUBSTITUTION OF COIN CHUTE NSQ1016L2/L4	
STEP	PROCEDURE
1	Remove hood and cover unit assembly as described in Chart 2.
2	Remove PCB assembly with caution as described in Chart 10.
3	Lift and hold spring loaded slide latch on coin chute mounting bracket and move front edge of coin chute to left until chute mounting studs are clear of chute bracket and slide latch.
4	Allow slide latch to its normal position.
5	Pull forward on coin chute to disengage rear mounting studs of coin chute from locating holes in mounting plate on rear wall of housing.
6	Replace coin chute by performing Steps 1 through 5 in reverse order.

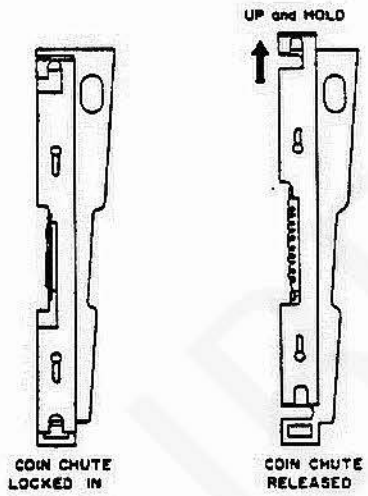


CHART 12 - SUBSTITUTION OF THE COIN RETURN RAMP AND CHUTE - RETURN ASSEMBLY	
STEP	PROCEDURE
1	Remove hood and cover unit assemblies as described in Chart 2.
2	Lift spring loaded slide latch on the coin chute mounting bracket. Pull coin return ramp forward until mounting tabs are disengaged from slots in upper end of coin return assembly and lower end of coin chute mounting bracket.
3	Remove guard assembly or plastic cover on coin relay.
4	Loosen pan head screw next to coin relay screw on lower part of coin hopper casting.
5	Lift upward on chute return assembly to remove it. Caution: This step must be carried out carefully to avoid damage to the wiring on the side of the coin relay.
6	Replace coin return ramp and chute return assembly by performing Steps 1 through 5 in a reverse order.

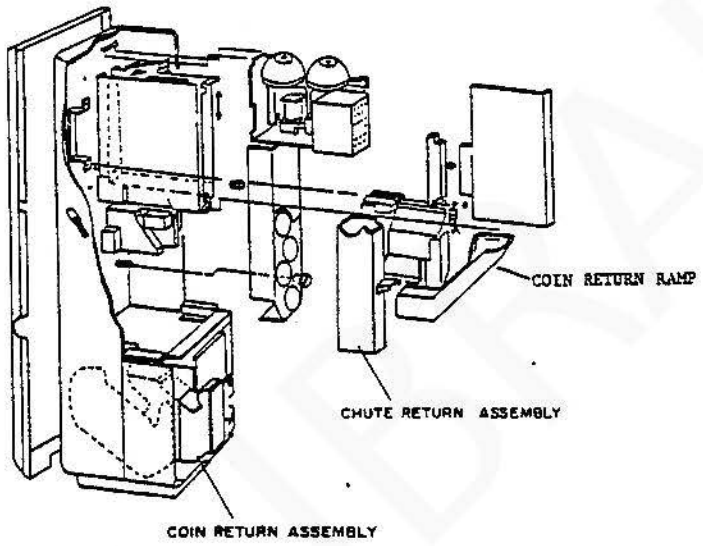
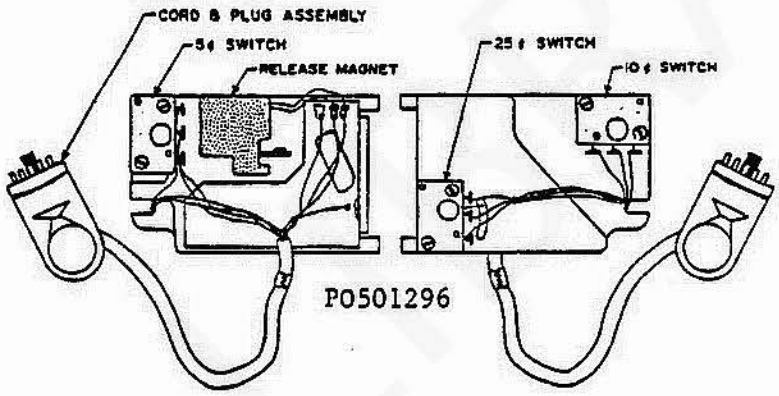
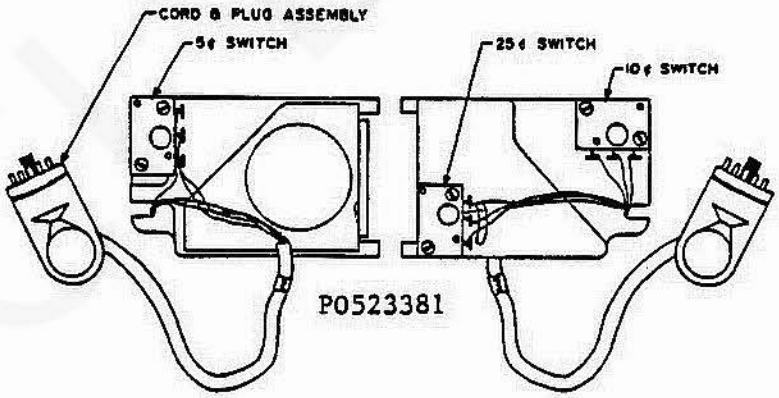


CHART 13 - SUBSTITUTION OF THE COIN SWITCH MODULE	
STEP	PROCEDURE
1	Remove hood and cover unit assembly as described in Chart 2.
2	Remove coin return ramp as described in Chart 12.
3	Disconnect plug 1 from jack 1 on apparatus module.
4	Completely loosen coin switch module mounting screw while pulling forward on module. Mounting screw should remain captive in coin switch module bracket in order to facilitate refastening of module into the set.
5	Identify coin switch module part number.
6	For part number P0501296 the mechanical coin totalizer must be disabled if not already done. See procedure Chart 17.
7	Part number P0523381 has no mechanical totalizer.



P0501296



P0523381

CHART 13 - SUBSTITUTION OF THE COIN SWITCH MODULE (Continued)	
STEP	PROCEDURE
8	Replace coin switch module by engaging the two rectangular lugs at rear of coin switch module in two rectangular holes in housing mounting plate.
9	Tighten mounting screw.
10	Connect plug 1 to jack on apparatus module.
11	Coins of each denomination should be deposited to determine that a proper alignment exists between coin chute, coin module and coin relay hopper mouth.

CHART 14 - SUBSTITUTION OF THE COIN RELAY	
STEP	PROCEDURE
1	Remove the hood and cover unit assembly as described in Chart 2.
2	Remove the coin return ramp and switch module as described in Chart 13 and 12.
3	Disconnect plug 4 from jack 4 on the apparatus module.
4	Loosen screw and remove the stay hook on the cable from plug 4.
5	Disconnect the following leads on the coin relay and remove from the wiring loop on the coin hopper, if so arranged. (a) BL-W lead on terminal 1. (b) W-BL lead on terminal 2. (c) O-W lead on terminal 3. (d) W-O lead on terminal G.
6 7	Remove two screws one from each side of the coin trigger bracket. Remove two slotted hex-head screws from the coin hopper casting. One on each side of the coin relay.
8	Check that the hopper trigger is in the horizional position (UP) and pull coin relay outward carefully so the coin trigger is not damaged. The cord which extends around the rear of the hopper shall be lifted over the top of the hopper.
9	Replace the coin relay as follows: (a) Move the vane on the hopper to left (collect) position. (b) With hopper trigger in non-operated (horizional) position move the relay into position until the trigger enters the T-shaped slot in the hopper, and the trap lever tab just enters the opening in the selector card. (c) Press down slighty on the ear on the left side of the selector card, and move the armature forward manually to its operated position. Hold the armature in this position. (d) Check that the cord is not trapped between the coin relay and hopper. Move the coin relay forward until the square stem on the vane enters the hole in the can, and the mounting screw holes line up.

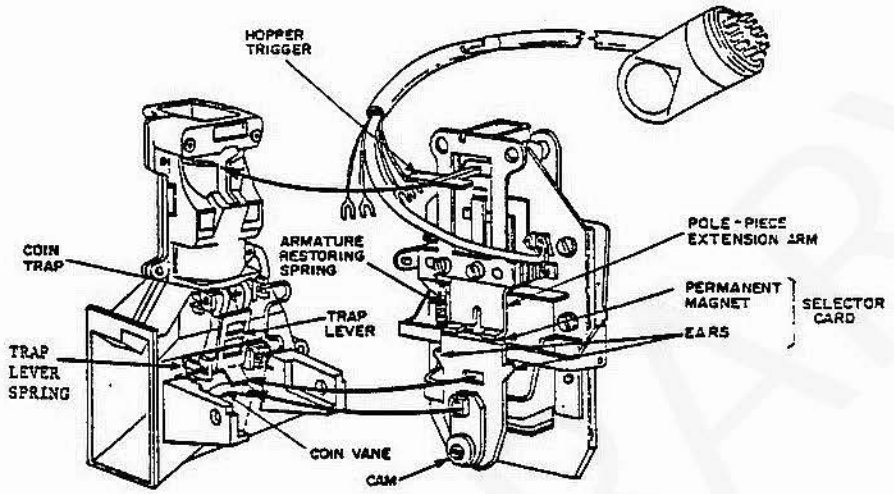
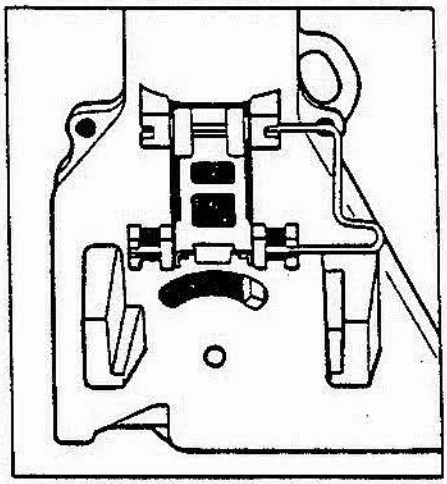
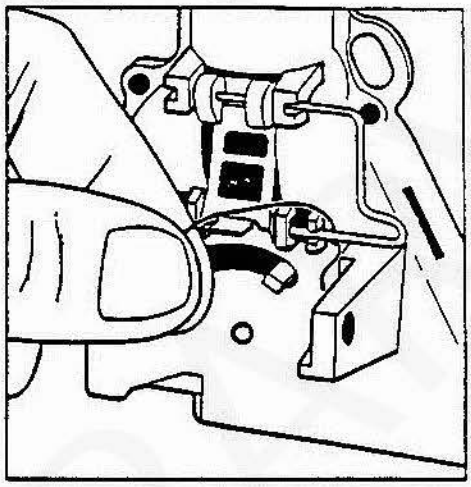
CHART 14 - SUBSTITUTION OF THE COIN RELAY (Continued)	
STEP	PROCEDURE
	
	(e) Replace the four screws removed in Steps 6 and 7, and tighten them evenly. (f) Make sure that the trigger, armature, trap, and vane, operate without binding. (g) Reconnect the leads removed in Step 5. Do not dress leads through the wiring loop. (h) Reconnect stay hook removed in step 4 and tighten screw. (j) Reconnect plug 4 to jack 4.
10	Perform coin relay and hopper tests described in Step 5 of Coin Routine.
11	Reassemble the coin switch module and coin return ramp removed in Step 2.
12	Place dust cover guard on coin relay.
13	Reassemble the cover unit assembly and hood cover.

CHART 15 - SUBSTITUTION OF TRAP LEVER SPRING	
STEP	PROCEDURE
1	Remove the hood and cover unit assembly.
2	Remove the coin return ramp and switch module.
3	Disconnect plug 4 from jack 4 on the apparatus module.
4	Loosen screw and remove the stay hook on the cable from plug 4.
5	Disconnect the following leads on the coin relay and remove from the wiring loop on the coin hopper, if so arranged: (a) BL-W lead on terminal 1. (b) W-BL lead on terminal 2. (c) O-W lead on terminal 3. (d) W-O lead on terminal G.
6	Remove two screws, one from each side of the coin trigger bracket.
7	Remove two slotted hex-head screws from the hopper casting, one on each side of the coin relay.
8	Check that the hopper trigger is in the horiziontal position (UP) and carefully pull the coin relay outward so that the trigger is not damaged. The cord which extends around the rear of the hopper must be lifted over the top of the hopper.
9	Move the vane in the hopper to the right side (refund position). Withdrawn the trap lever pin and remove both the trap and trap lever
10	Pry open the trap lever spring and remove it from the trap lever.
11	Reassemble the trap, trap lever and trap lever pin as shown in Fig. (a). CAUTION: The longest leg of the trap lever pin must be used for the trap lever hinge at the lower end of the assembly. This may be opposite to the way it was previously assembled.
12	Assemble the new trap lever spring as shown in Fig. b to d.
13	Replace the coin relay as follows (see procedure Chart 14) (a) Move vane on hopper to left (collect) position. (b) With hopper trigger in nonoperated (or horizional) position, move relay into position until trigger enters T-shape slot in hopper and trap lever tab just enters opening in selector card.

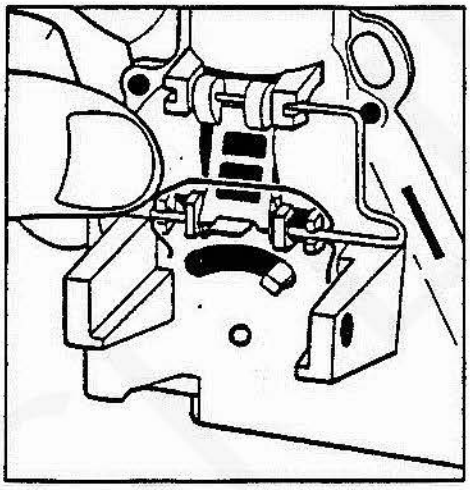
CHART 15 - SUBSTITUTION OF TRAP LEVER SPRING (Continued)	
STEP	PROCEDURE



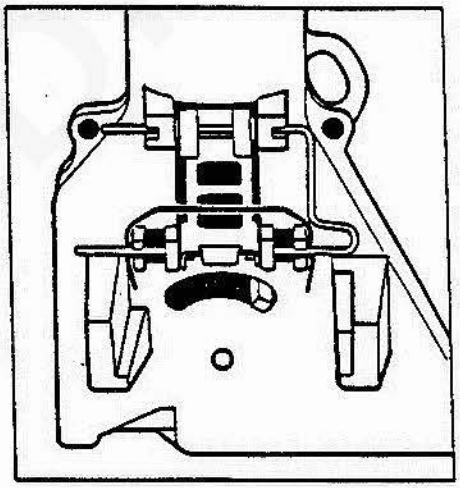
(a)



(b)



(c)



(d)

CHART 15 - SUBSTITUTION OF TRAP LEVER SPRING (Continued)	
STEP	PROCEDURE
	(c) Press down slightly on ear on left side of selector card and manually move armature forward to its operated position. Hold armature in this position. (d) Check that the cord is not trapped between coin relay and hopper. Move coin relay forward until square stem on vane enters hole in cam and mounting screw holes line up. (e) Place and evenly tighten the four screws removed in Steps 6 and 7. (f) Make sure that trigger, armature, trap and vane operate without binding. (g) Reconnect the leads removed in Step 5. Do not dress leads through the wiring loop. (h) Reconnect stay removed in Step 4 and tighten screw. (i) Reconnect plug 4 to jack 4.
14	Perform coin relay and hopper tests described in Step 5 of Coin Routine.
15	Reassemble the coin switch module and coin return ramp removed in Step 2.
16	Place dust cover guard on coin relay.
17	Reassemble the cover unit assembly and hood.

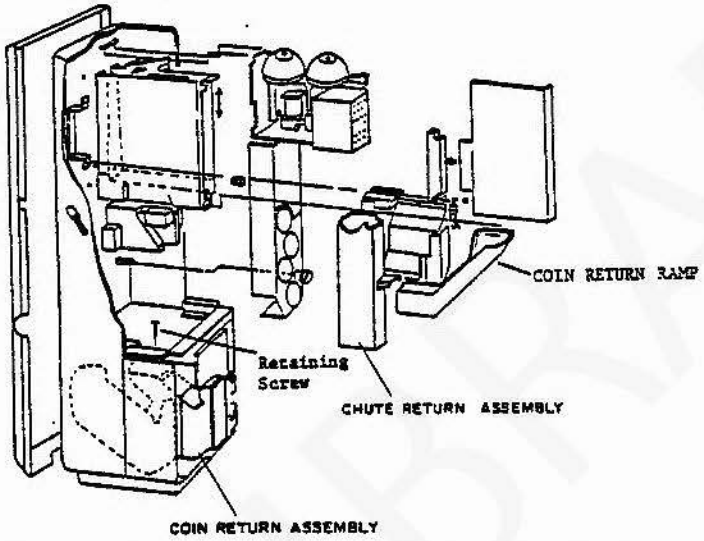
CHART 16 - SUBSTITUTION OF THE COIN RETURN ASSEMBLY	
STEP	PROCEDURE
1	Remove hood and cover assembly as described in Chart 2.
2	Remove coin return ramp and chute return assembly as described in Chart 12.
3	Remove coin return assembly retaining screw next to the base of the coin relay. 
4	Tilt top of coin return assembly forward from front of the housing.
5	Remove coin return assembly by pulling outward and upward.
6	Replace coin return assembly by performing Steps 1 through 5 in reverse order.

CHART 17 - OPTIONS AND CONVERSIONS	
STEP	PROCEDURE
	ELECTRONIC TOTALIZER AND FASN CONVERSION
1	Remove hood and cover unit assemblies as described in Chart 2.
2	Move BL-Y lead on TB1 of apparatus module from terminal 10 to terminal 4.
3	Disconnect O-BK and S-R leads from terminals 9 and 6 on TB1 of apparatus module. Insulate spade tips and store leads.
4	Identify coin switch module part number (procedure Chart 13) Part Number P0523381 proceed to Step 12. Part Number P0501296 continue to next Step.
5	Remove coin switch module.
6	Cut O-W lead to upper end of reed switch on coin switch module. Insulate and store lead.
7	With longnose pliers remove two metal pins which extend through the upper plate to secure plastic pawls.

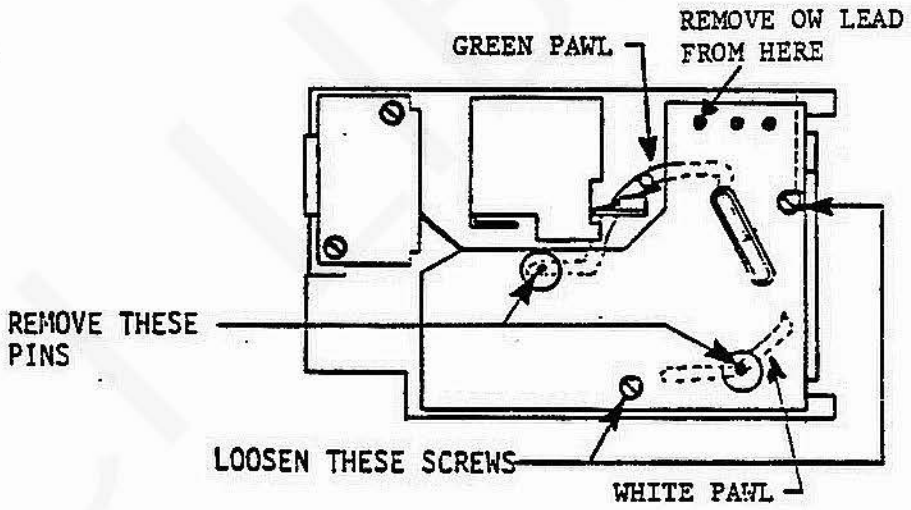


CHART 17 - OPTIONS AND CONVERSIONS (Continued)	
STEP	PROCEDURE
8	Loosen the two screws that held plate down.
9	Raise the plate and shake the pawls out.
10	Tighten screws.
11	Replace coin switch module.
	PCB OPTIONS
12	Remove PCB with caution described in Procedure Chart 10.
13	Move green leads to terminals C and D.
14	Move R lead to required initial rate terminal.
15	BK ground isolation leads are to be connected to terminals X and Y to install option. See note.

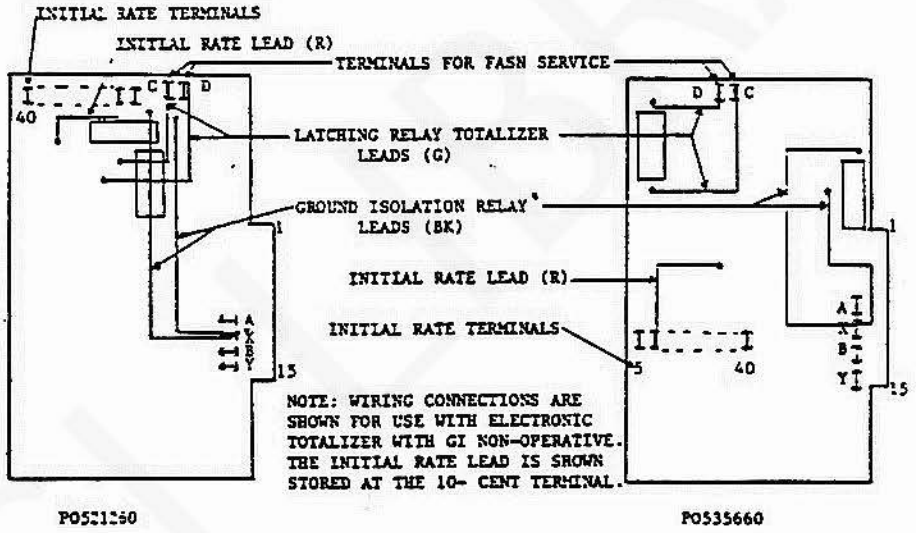


CHART 17 - OPTIONS AND CONVERSION (Continued)

STEP	PROCEDURE
16	Insert PCB assembly back in edge connector.

NOTE: The G.I. Option (Ground Isolation) is used to improve voice transmission by removing the coin ground which unbalances the loop and increase the circuit noise. The ground is restored during the initial rate and coin collect/return signalling. This option requires that the office perform the initial rate test (coin presence test) and coin collect/return signalling on the tip with the ring open. The following table identifies the office types for which this option is not compatible and may prevent the placing of local calls or coin collect/return problems if installed. The option is removed by placing both BK leads on X or Y terminals.

OFFICE TYPE	GI COMPATIBLE
#5XBAR	no
C1EAX	yes
#2EAX	yes
SP1	yes
DMS 10	yes
DMS 100	yes
DMS 100-RLM	yes
GTD 5	yes
MCL	yes

*

SUBSCRIBER CARRIER	GI COMPATIBLE
S6A	N/A
S6B	no
CM8	N/A
DMS 1	yes
DMS 1-U	no
DM32S	yes
Lynch B325L	yes
Lynch 300S	yes
Lynch 300M	yes
Timespan 32	yes
Timespan 128	yes

* Denotes Change this issue

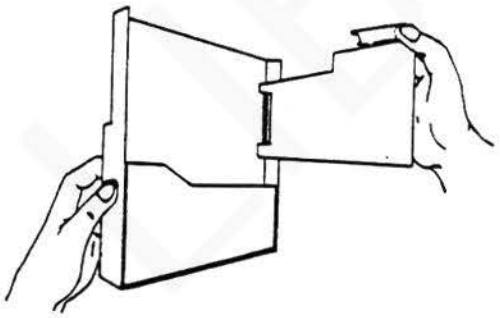
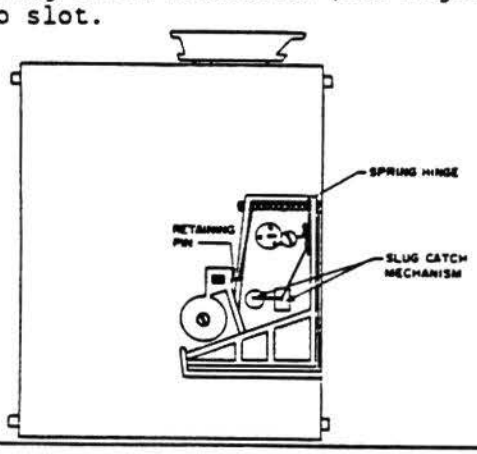
CHART 18 - CLEARING STUCK COINS	
STEP	PROCEDURE
	Coins removed are to be deposited and collected by manual operation of the coin relay or by calling the operator and requesting a coin collect after coins are deposited. Overflow coins (cash box full) are to be returned per procedure in OP 17-05-30-035 and the Coin Centre notified of all full boxes. Out of service sign QSW1A is to be placed on set when cash box is full.
1.	Remove hood and cover unit assembly as described in Chart 2.
2.	Visually identify area of obstruction as being in one of the following assemblies or proceed to Step 3. a. Coin Chute - see Step 3. b. Coin Switch Module - see Step 9. c. Coin Hopper Assembly - see Step 12.
3.	Remove coin chute assembly as described in Chart 11.
4	Open hinged portion of coin chute as shown in figure. Invert or manually operate release mechanism to clear jammed coins. 
5.	Check for slugs that may be trapped by removing retaining pin from slot and opening catch mechanism (see figure). Restore retaining pin into slot. 

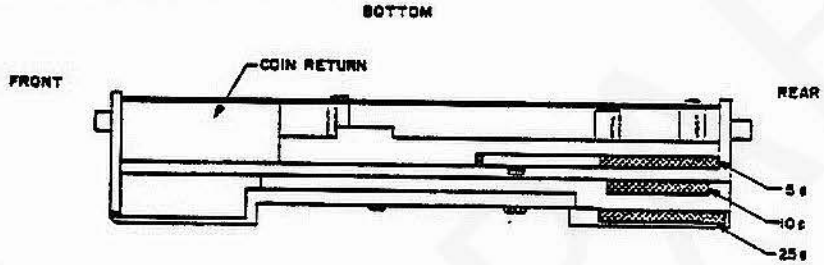
CHART 18 = CLEARING STUCK COINS	
STEP	PROCEDURE
6.	Inspect coin chute for dirt, grease and foreign material. Clean if necessary by immersing in warm soapy water and agitating gently. Rinse with clean water and shake to remove excess. Allow time to drip dry.
7.	With coin chute removed from set, test operation by depositing a nickel, dime and quarter. Verify exit to coins from chute through proper slot as identified in figure. (Note: Coin chute must be held in a vertical position). 
8.	If coins are rejected (exit coin return slot) or become stuck, replace coin chute.
9.	Remove coin switch module as described in Chart 13.
10.	Inspect coin switch module for stuck coins. Remove by inverting and shaking coin switch module. NOTE: If a tool is used to remove stuck coins, care should be taken not to damage the actuating arms of the micro switches.
11.	Test for passage of coins through the appropiate channels as shown in figure. If coins do not pass freely or jam, the coin switch module is to be replaced.
12.	Insert coin leveling tool into opening at the bottom right of coin hopper assembly.
13.	Rotate leveling tool to evenly distribute coins in cash box. NOTE: Indentify full coin box to Coin Centre and post set out of service with QSW1A sign.
14.	Tilt selector card on coin relay to the left and manually operate coin relay armature to collect coins in hopper.

CHART 18 - CLEARING STUCK COINS	
STEP	PROCEDURE
	NOTE: If armature does not move freely do not force. Tilt selector card to the right and again try to operate coin relay armature to return coins. If armature still does not move freely, remove coin relay as described in Procedure Chart 14. With relay removed, operate coin hopper lever vane to clear coins. Inspect trap lever spring replace as required.
15.	Replace coin switch module, coin chute and cover unit assembly.
16.	Retest set as per Step 6 of seven step routine.

SEVEN STEP PREPAY COIN ROUTINE CHECK LIST

GUIDELINES (What steps are to be completed)

a. Installation - STEPS 1,2,3,4,5,6,7

b. Regular Repair Visit - STEPS 1,2,7 and STEPS 3,6 if cover unit assembly is removed.

c. Repair Visit of no Coin Collect/Return STEPS 1,2,3,5,6,7 and STEP 4 if a repeat report.

d. Routine Visit - STEPS 1,2,7 and STEPS 3,4,5,6 if faults are detected in 1 or 2

STEP 1 INITIAL SET INSPECTION	YES	NO
a. Set securely mounted and vertical	( )	( )
b. Rotary or Touch Tone dial in working order	( )	( )
c. Hookswitch operates without sticking	( )	( )
e. Handset intact	( )	( )
f. Armoured cord intact	( )	( )
g. Coin return door operates freely	( )	( )
h. Number card present	( )	( )
i. Instruction cards correct	( )	( )
j. Ground connection secure	( )	( )

STEP 2 OPERATIONAL TESTS	YES	NO
a. Local Call		
1. Lift handset off-hook		
* Dial tone present	( )	( )
2. Deposit two nickels and one dime		
3. Dial office milliwatt		
* Dial tone removed	( )	( )
* Office returns fast busy	( )	( )
4. Place handset on-hook		
* Coins returned	( )	( )
5. Lift handset off-hook		
6. Deposit quarter		
7. Dial office milliwatt		
* Call completes	( )	( )
8. Place handset on-hook		
* Coins collected	( )	( )
b. Toll Call		
1. Lift handset off-hook		
2. Deposit a dime		
3. Dial 0 (Operator)		
* Coin returned	( )	( )
* Operator answered	( )	( )
4. Have operator identify a deposit of a nickel, dime and quarter		
* Coins identified correctly.	( )	( )
5. Ask operator to return coins		
* Coins returned	( )	( )
6. Deposit nickel		
7. Ask operator to collect coin		
* Coin collected	( )	( )
8. Ask operator to ringback		
* Bells ring	( )	( )

STEP 3 INTERNAL SET INSPECTION	YES	NO
a. Options installed correctly	( )	( )
b. Connections secure	( )	( )
c. Coins leveled	( )	( )
d. Coin chute clean	( )	( )
e. P.C.B. fully seated	( )	( )
f. Coin switch properly aligned ...	( )	( )
g. Coin relay connections tight ...	( )	( )
h. Coin relay contacts clean	( )	( )
i. Coin relay selector magnet and pole piece extensions free of dirt and foreign material	( )	( )
j. Trigger sw. trips on dime deposit	( )	( )
k. Relay dust cover in place	( )	( )
l. Coin return ramp in place	( )	( )
m. Hookswitch dust cover in place .	( )	( )
STEP 4 TRANSMISSION TESTS	PASS( )	FAIL( )
STEP 5 COIN RELAY AND HOPPER TESTS	( )	( )
STEP 6 FINAL TESTS AND INSPECTIONS (Repeat STEPS 1 & 2)		
STEP 7 VISUAL INSPECTION OF ITEMS	YES	NO
a. Booth anchored and grounded	( )	( )
b. Glass clean	( )	( )
c. Door opens and closes freely ...	( )	( )
d. Light working	( )	( )
e. Directory current issue for loc.	( )	( )
f. Signs clean and secure	( )	( )
g. Installation visible and accessible to public	( )	( )

REFERENCE ATP 506-1109-501

AGT

PREPAY COIN ROUTINE CHECK LIST

The End