

DIRECT REUSE AND REHABILITATION OF
CROSSBAR CENTRAL OFFICE EQUIPMENT

1. GENERAL

1.01 This Section provides new guidelines and procedures to be followed in the evaluation and rehabilitation of all Crossbar and associated central office equipment to be reused through direct reuse or placed in "CE" or "R" stock. This Section compliments Engineering Section 790-100-907SW.

1.02 Crossbar equipment will be classed into two categories, "A" and "B". Generally category "A" will cover equipment vintage of 0-10 years. No defect evaluation will be required of this equipment before reuse. Generally, category "B" will cover equipment vintage of 11 years and older. All equipment planned for reuse in this category will be evaluated for defects as described in Part 5. The condition of equipment at a particular office may warrant an adjustment of these categories as determined at the pre-order meeting.

1.03 It is expected that all equipment to be removed will be maintained in an economical and trouble free condition to give acceptable customer service. Curtailment of maintenance or removing this equipment from the Controlled Maintenance Plan is not justified even though it is known that the equipment is to be removed from service. It is not expected, however, that the equipment to be removed be in a like new condition. The equipment shall meet the standard maintenance requirements necessary to provide good acceptable customer service.

2. PRE-ORDER MEETING

2.01 A pre-order meeting is required with every major removal (10 or more frames)

of company control equipment and is recommended for all COE removals when requested by Area Engineers when:

- (a) An inventory and/or evaluation will be made;
- (b) Disposition will be by Western Electric Direct Reuse; and
- (c) The amount and type of displaced equipment offers transition, removal or reuse problems.

2.02 Generally, the following criteria will be used in determining what portion of the removed equipment will be junked:

- (a) Obsolete equipment for which there is no reuse demand within or outside the Bell System, such as, (connector bays equipped with 245, 254, 263, & 264 type multi contact relays) ORMC, IRMC, etc.
- (b) Equipment not considered to be economical to rehabilitate after evaluation.

2.03 The following will be decided or discussed at the pre-order meeting:

- (a) The equipment that will automatically be junked, regardless of age or condition.
- (b) That portion of the reusable equipment which will be evaluated and/or inventoried.

2.04 The pre-order meeting shall be held 24 weeks before the main order is due to Western Electric if an inventory and/or evaluation on equipment is required. The

pre-order meeting shall be held either at the removal location or at a location permitting the conferees to inspect the office.

2.05 The following personnel shall attend the pre-order meeting:

- (a) The Telephone Company Engineer responsible for removal or his representative shall act as chairman.
- (b) Western Electric Direct Reuse Coordinator (only if any part of the displaced equipment will be disposed of through Western Electric Direct Reuse).
- (c) The Western Electric Line Engineer who shall act as Secretary.
- (d) Western Electric Installation Representatives.
- (e) Plant Department Representatives.
 - 1. Plant Supervisor or his representative.
 - 2. Equipment Chief.
 - 3. Chief Switchman.
 - 4. Evaluator(s) (Appointed by the Plant Supervisor).
- (f) The Traffic Engineer and Manager-Network Administration (only if transitions will be required).
- (g) A Circuit Engineer (only if circuit equipment is to be removed or space being vacated will be assigned for future circuit equipment).
- (h) A Switching Engineer (only if switching equipment is to be removed or the space being vacated will be

assigned for future equipment).

- (i) Other participants as deemed necessary.

3. EQUIPMENT INVENTORY AND EVALUATION PROCEDURES

3.01 Following the pre-order meeting the Telephone Company Engineer shall request the Western Electric Engineering representative to provide inventory and evaluation worksheets for all equipment specified for reuse. See Exhibits 7-10 for equipment evaluation sheets. The following information shall be provided:

- (a) Year of manufacture. The inventory may be made by Plant or Western Electric and returned to the Telephone Company Engineer who will summarize the equipment to determine the number of units manufactured within 10 years. The Telephone Company Engineer will return the worksheets to Plant requesting necessary evaluation of equipment over 10 years old.

- (b) Any equipment judged non-repairable during evaluation will be marked "j" (junk). All needed repairs will be shown on the appropriate worksheets for all repairable units. Where it appears likely that the needed equipment can be taken from units needing no repairs, they will be shown as "S" (save). When the necessary quantity of "S" units are found, the evaluation ends and the work sheets are returned to the Telephone Company Engineer.

4. RESPONSIBILITY OF EVALUATORS

4.01 It will be the responsibility of the evaluator to determine the condition of equipment planned for reuse that is subject to service affecting deterioration due to usage and/or age. Results of the evaluation may cause the equipment to be junked rather than saved. Identify needed repairs before

the equipment can be placed in service.

4.02 The evaluator(s) will take the list of equipment to be evaluated, using the Inventory and Evaluation Worksheet, and evaluate all equipment planned for reuse that falls under category B (equipment 11 years and older) for repairs that must be made by this office prior to removal and reuse. The results of the evaluation will be recorded on the Inventory and Evaluation Worksheet on lines 3 and 4 of Section "B" using Section "C" as a guide. (See Exhibit 8).

4.03 The evaluator will initial and return the completed worksheets along with the list of corrections to be made to the Telephone Company Engineer.

5. EQUIPMENT EVALUATION - METHOD

5.01 The following items will be the criteria for evaluating Crossbar type equipment:

(a) General inspection - Note all unusual conditions like excessive dirt, broken relay parts (springs, backstops, cards, etc).

(b) Make relay contact evaluation per the following observation techniques. (See Exhibits 1 thru 6 for contact erosion usage). (See Exhibit 7 for recording evaluations).

A 10X magnifying glass and a light source is required. It is important to position the lamp so as to fully illuminate the fixed contacts to be inspected. Care shall be taken to avoid casting shadows from the twin contacts which make it difficult to make a reasonable estimate of contact erosion. Other conditions which can cause difficulty in making erosion estimates are:

1. Black powder buildup - In most cases where contacts are eroding, there is a considerable amount of black powder. It tends to build up on surfaces surrounding the contact area so that the fixed contact appears thicker than it actually seems. (See Exhibit 3). The black powder shall be removed before estimating the erosion. See techniques outlined in Section 069-306-801 for removing the black powder.

2. Erosion hidden behind the front edge of precious metal - Frequently the front of the twin contacts strike behind the edge of the precious metal on the single fixed contact. As the single fixed contact erodes, a thin wall of precious metal remains along the front edge of the single contact. (See Exhibit 4). It is important to illuminate the area behind this wall to make a reasonable estimate.

3. Smoothly eroded contacts - Occasionally contacts are observed that are eroded but do not have grooved surfaces. (See Exhibit 5). This can be caused by contacts which are sufficiently variant, to erode the entire surface. Since in this case there are no erosion channels, comparison of the thickness of the precious metal on this contact shall be made with a nearby noneroded contact on the same relay.

4. Contacts with unprotected loads - There are some contacts which are not protected, either by design intent or omission during manufacture or installation. This type of erosion is shown in Exhibit 6.

Contacts that are 3/4 or more eroded shall be replaced before the equipment is ready for reuse.

Dial Tone Marker

(a) Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.

(b) Make relay contact inspection for eroded contacts. Relays to be evaluated are listed in Exhibit 9. Record defects on inventory and evaluation worksheets, Exhibit 7.

Completing Marker

- (a) Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.
- (b) Make relay contact inspection for eroded contacts. Relays to be evaluated are listed in Exhibit 10. Record defects on inventory and evaluation worksheets, Exhibit 7.

ORMC, IRMC, & LLMC

- (a) Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.
- (b) On connector frames evaluate all CB relay contacts. Record on inventory and evaluation worksheets, Exhibit 7. (See Note 2)

Originating Registers

- (a) Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.
- (b) Make relay contact inspection on the RA, RA1, P1, & P2 relays. Record defects on inventory and evaluation worksheets, Exhibit 7. (See Note 1)

Line Link Frame

- (a) Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.
- (b) Make relay contact inspection on TM relay. Record defects on inventory and evaluation worksheets, Exhibit 7.

A.M.A. Recorder - Master Timer

- (a) Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.
- (b) Inspect 206 type selector switch for:
 1. Rotor cleaning (See Note 3)
 2. Bank cleaning (See Note 3)
 3. Lubrication (See Note 3)
 4. Mechanical parts (Worn broken or loose parts). Record defects on Exhibit 7.

Transverter Connector

Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8. (See Note 2)

Incoming Register

- (a) Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.
- (b) Make relay contact inspection on the ON, RA, and 2CK relays. Record defects on inventory and evaluation worksheets, Exhibit 7. (See Note 1).

Outsender - MF, DP, RP, LLP

- (a) Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.
- (b) Make relay contact inspection on the P, P1, P2, P3, and P4 relays. Record defects on inventory and evaluation worksheets, Exhibit 7. (See Note 1).

Transverters

Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.

Trunk Link Frame & T.L.C.

Make general inspection - Record defects on inventory and evaluation worksheets, Exhibit 8.

Associated Equipment

No evaluation required unless specified at pre-order meeting.

NOTE 1: Junk all U & Y type markers, senders, originating registers, and incoming registers.

NOTE 2: Junk all connector frames (ORMC, IRMC, TVC, etc., equipped with 245, 254, 263, 264, type multi contact relays.

NOTE 3: Maintenance items corrected at receiving end (if required) but billable to the area of removal.

6. ARE PLANT CONTROLS AND RESPONSIBILITY

6.01 The Area Plant Supervisor's office will be the control location on all job removals within his jurisdiction. He will be responsible for:

- (a) Appointment of evaluators.
- (b) Protection of equipment after inventory (equipment not relocated or cannibalized By local Plant).

- (c) Rehabilitation of equipment (as noted by evaluation).
- (d) Notify Equipment Engineer of job completion (equipment repaired and ready for removal).

7. RECEIVING OFFICE RESPONSIBILITY

7.01 The following listed maintenance items and other minor repairs (excluding 206 selector repairs) will be corrected with the cost of such repairs absorbed by the receiving location:

- (a) Equipment according to the manufacture date, that falls within the vintage dates of 0-10 years. (This vintage equipment was not evaluated at the removing location).
- (b) Equipment will be blown outside the equipment room. (This work to be done by the Western Electric Company, prior to reuse, and billed to the reusing office by the Western Electric Company).
- (c) 206 Selectors (rotor and bank cleaning, lubrication, see Note 1).

NOTE 1: Cost associated with 206 selector. Switch repair (if necessary) may be billed back to the removal area. (See Para. 9.01).

NOTE 2: Item "b" shall be performed by the Western Electric Company prior to turnover to Plant (see Para. 8.01 and 8.02). Items "a", "b", and "c" shall be performed prior to classification and frequency as prescribed by the ELT for that equipment.

7.02 Any equipment received in a damaged condition as a result of packing and shipping will be immediately referred back to the Telephone Company Engineer for proper disposition.

8. INSTALLATION REQUIREMENTS AND ACCEPTANCE PROCEDURES

8.01 Equipment or apparatus furnished by the Telephone Company, whether new, reused, or relocated, and equipment affected by wiring changes, shall be verified and tested by

Western Electric Company using regular verification inspection and test procedures, unless otherwise specified by the Telephone Company. (The Telephone Company is responsible for assuring that any material it furnishes requires no adjustment or test effort in excess of that normal for new equipment and the Telephone Company assumes all responsibility for the proper functioning of any used material it furnishes). All excessive adjustments shall be paid for by the Telephone Company.

8.02 As part of the installation, tests shall be performed by the Western Electric Company to verify all operating features and functions of the reuse equipment. The features and functions of equipment is outlined in the General and Specific Performance Requirements in the 800 series of the Bell System Practices along with Circuit and Transmission Requirements. These tests shall be performed after the completion of all verification inspection and prior to turnover of the equipment to the Telephone Company.

9. PLANT AND WESTERN ELECTRIC MATERIAL AND LABOR CHARGES

9.01 Where applicable, the Plant labor hours expended in the repair or reuse equipment shall be reported to the appropriate location and account codes of the division from which the equipment was transferred. The hours shall not be reported to the estimate which authorized the installation of the central office equipment. The hours and cost will be automatically interoffice billed by the Accounting Department between divisions. This method will keep the hours and related cost out of the E-5300 for the receiving division and properly include them on the E-5300 in the transferring division.

9.02 When reconditioning work is to be performed by the Western Electric Company Installer, a written request detailing work to be done must be prepared and signed at the Plant division level before forwarding to the Engineering Manager-Equipment and Buildings. All material and labor shall be initially charged to the reusing location "R" account.

9.03 Where applicable, the Western Electric Company charges shall be transferred by the Area Engineer to the removal location if notice is given by Plant within 60 days after the reusing job completes. No charges for reconditioning work will be transferred after the reusing order has been final billed.

NOTE: The procedures for transferring hours between areas will only apply when both General Plant Managers have agreed on the work to be done and the location to be charged.

STANDARD MAKE CONTACT

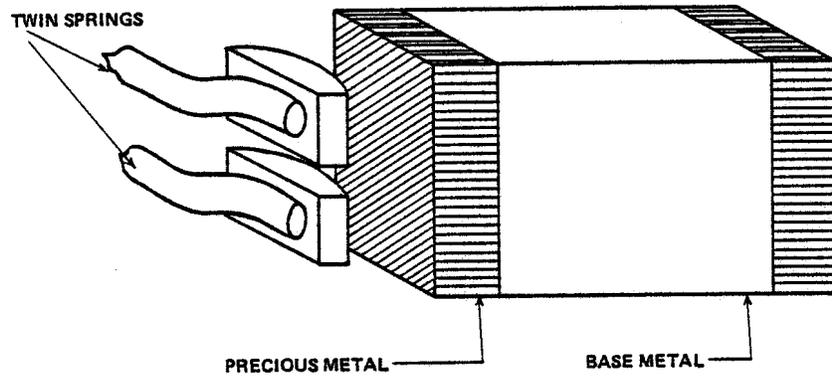


EXHIBIT 1

CONTACT ERODED TO 1/2

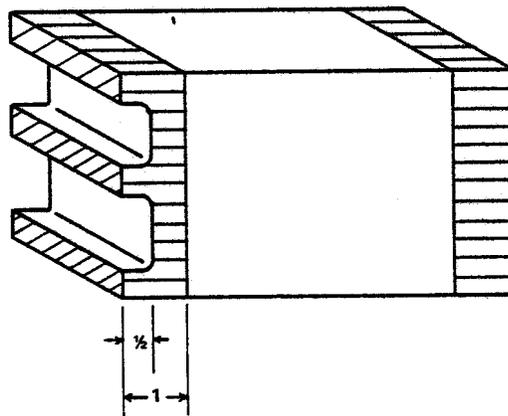


EXHIBIT 2

BLACK POWDER BUILD UP

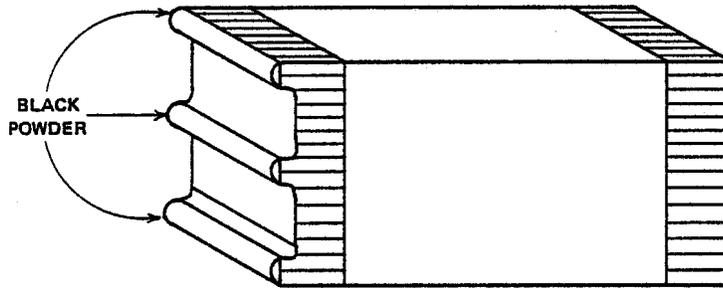


EXHIBIT 3

EROSION HIDDEN BY FRONT EDGE OF PRECIOUS METAL

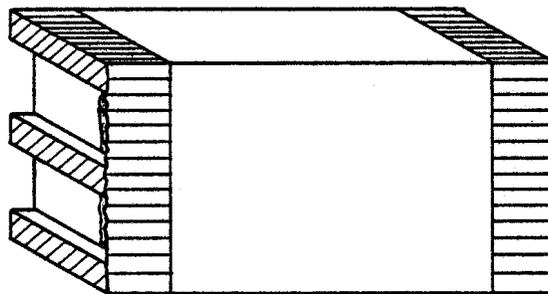


EXHIBIT 4

SMOOTHLY ERODED CONTACT

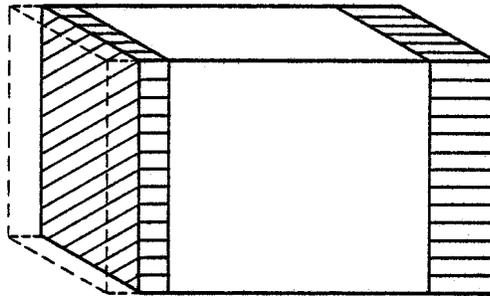


EXHIBIT 5

CONTACT MAKING UNPROTECTED LOAD

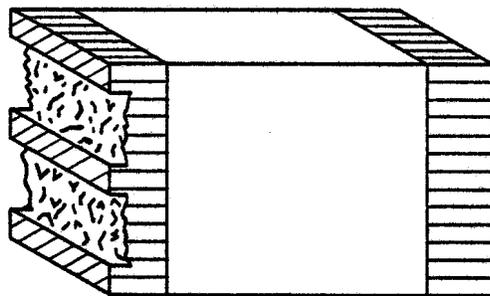


EXHIBIT 6

EXHIBIT 8

FORM SW97-501

FORM SW97-501

EQUIPMENT	0	1	2	3	4	5	6	7	8	9
FRAME										
1. INVENTORY										
2. YEAR MANF.										
3. EVALUATION										
4. REPAIR										
5. DISPOSITION										

INVENT. BY: _____ EVAL. BY: _____ REPAIR BY: _____
 DATE: _____ DATE: _____ DATE: _____

(A) WIRING LIST T				
CL.	EQUIP.	DRAWING	LIST	DISPOS.

(C)	
REPAIRS REQUIRED	
1.	CONTACT REPLACEMENT
2.	RELAY REPLACEMENT
3.	PRESSURE CLEAN
4.	OTHER (NOTE DEFECTS IN REMARKS)
5.	

Block (A) W.E. or Tel. Co. Eng. Completes. Dispos. should show "S" for save or J for Junk.

Block (B) W.E. Inst. or plant completes Line 1 and/or 2. Line 1 - same as block (A); Line 2 - last 2 digits of year manf.

Block (B) Plant completes lines 3 and 4. "A" - reuse as is; "R" - reuse with repairs; "J" - Not reusable; Line 4 - show repair per block "C".

Block (B) Tel. Co. Eng. completes Line 5. "D" - WEDR, "T" - TelCo will dispose, "J" - Junk.

REMARKS:

INV. & EVA. WORKSHEET - X-BAR VARIOUS FRAMES		
TOWN	STATE	
SPEC.	SECTION	PAGE
OFFICE: SOUTHWESTERN BELL TEL. CO.		

EXHIBIT 9

FORM SW97-502A

FORM SW97-502A

OFFICE		EQUIP.										DATE EQUIP. PLACED IN SERVICE		
RELAY	EQUIP. LOC.	DIAL TONE MARKERS												
		MARKER NO.												
		0	1	2	3	4	5	6	7	8	9			
CONTACT STATUS														
FMK	45													
FMG	46													
FTCK	45													
FTCK1	45													
TBR	45													
TFK1	45													
JGO	43													
STP1	43													
HGR	38													
VTK1	37													
FTK1	37													
VGR	37													
GK	37													
AO	32													
RK1	32													
RK2	32													
GTL3	30													
DVO	29													
DVA	29													
JXP1	28													
HMS1	28													
HMT1	28													

OFFICE DATA: REPAIRS REQUIRED:
 1. Contact replacement
 2. Relay replacement
 3. Pressure clean
 4. Other defects noted

INV. & EVA. WORKSHEET - X-BAR
 DIAL TONE MARKER

TOWN _____ STATE _____

SPEC _____ SECTION _____ PAGE _____

OFFICE: _____
 SOUTHWESTERN BELL TEL. CO.

EXHIBIT 9 (Cont'd)

FORM SW97-502B

FORM SW97-502B

OFFICE		EQUIP.											DATE EQUIP. PLACED IN SERVICE	
RELAY	EQUIP. LOC.	DIAL TONE MARKERS												
		MARKER NO.												
		0	1	2	3	4	5	6	7	8	9			
		CONTACT STATUS												
CHA	24													
TK	24													
DTK	23													
FAK	22													
MAK1	22													
DIS1	22													
LLC1	22													
RYC	22													
TLC	22													
CKG1	22													
LLC2	22													
TM	22													
RYT1	13													
JLE	35													

OFFICE DATA: REPAIRS REQUIRED:
 1. Contact replacement
 2. Relay replacement
 3. Pressure clean
 4. Other defects noted

INV. & EVA. WORKSHEET - X-BAR
 DIAL TONE MARKER

TOWN _____ STATE _____

SPEC _____ SECTION _____ PAGE _____

OFFICE: _____
 SOUTHWESTERN BELL TEL. CO.

FORM SW97-503A

OFFICE		EQUIP.										DATE EQUIP. PLACED IN SERVICE		
RELAY	EQUIP. LOC.	COMPLETING MARKERS												
		MARKER NO.												
		0	1	2	3	4	5	6	7	8	9			
												CONTACT STATUS		
CB2	C-47L													
FTK1	C-47L													
HTK1	C-46L													
CB3	C-45L													
CB4	C-45L													
VTK1	C-44L													
CB	C-43L													
CB1	C-42L													
JGO	C-39L													
STP1	C-39L													
LLC2	C-39L													
RCK2	C-34L													
RSK	C-34L													
UK	C-32L													
NGK1	C-32L													
SNG2	C-32L													
RNG	C-31L													
LL1	C-31L													
ONX	C-5L													
FMK	C-46R													
TFK2	C-45R													
CKG2	C-37R													

OFFICE DATA:

REPAIRS REQUIRED:

1. Contact replacement
2. Relay replacement
3. Pressure clean
4. Other defects noted

INV. & EVA. WORKSHEET - X-BAR NO. 5
COMPLETING MARKERS

TOWN _____ STATE _____

SPEC _____ SECTION _____ PAGE _____

OFFICE: _____
SOUTHWESTERN BELL TEL. CO.

