



## REPAIR METHODOLOGY/QUALITY ASSURANCE

CMS Communications employs automated systems, environmental controls, extensive testing and experienced personnel to ensure that all equipment refurbished by CMS is of the highest quality.

Our fourteen step refurbishing methodology, developed over the course of several years is employed on all equipment refurbished in our lab. Our process is centered on comparison testing methodologies. Our repair is verified by extensive component testing (using load simulators to create in service conditions). Our system is one of the most stringent in the industry.

An outline of our repair procedure is as follows:

- 1) Each item is bar-coded upon its receipt. A visual check of the circuitry is performed. The equipment is inserted and initialized in the appropriate test bay.
- 2) All ports are checked for telephony functions i.e., ring generation, transmit/receive, etc. At this stage the failed circuit is identified. If no trouble is found, a 24 hour burn-in test is employed, complete with load simulation. If no failure occurs during this period, the equipment is then removed from the process fully refurbished and returned.
- 3) Telephone instrument electronics are removed from their casings. These casings are sent through a meticulous refurbishing process, to be reunited with the electronic circuitry later in the process. Casing refurbishment involves a combination of painting, stenciling, sandblasting, buffing and polishing dependent upon the type of instrument.
- 4) Component level trouble shooting is performed on each failed circuit. Using a Huntron or other digital meter, each component's signature and voltage is compared to the signature and voltage of a known good component. Faulty components are thus identified.
- 5) Bad components are carefully removed. This is accomplished by heating the solder joint to the melting point and removing the solder with an applied suction device. The component is then removed using a tool specially designed for the task.
- 6) Using a component insertion device, replacement components are positioned and secured. Solder is then applied to adhere the new component.
- 7) Using light brush and static free solvent, excess solder is removed to prevent conduction and/or shorts.
- 8) Placed under a magnification device at a specially illuminated inspection station, each solder joint is examined for cold solders.
- 9) Each new component is retested to ensure the proper signature and voltage.
- 10) The equipment is given a functional test by the bench technician who repaired it. Using the appropriate test bay, the same procedures described in step #2 are employed.
- 11) Telephone instruments are reassembled using the fully refurbished or new casings.
- 12) A 24 to 48 hour burn-in test is employed, complete with load simulators to create in service conditions.
- 13) If no failure occurs during the burn-in period, a final test is performed per step #2.
- 14) Circuit cards and telephones are packaged in static protected and shock absorbing materials, then individually boxed. Labels can include customer specific information if desired.

Not all equipment may be economically feasible to repair. Unrepairable items will be returned to the customer at no charge.